NATIONAL PETROLEUM NEWS

NEW Refining Technology EDITION

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DETROIT

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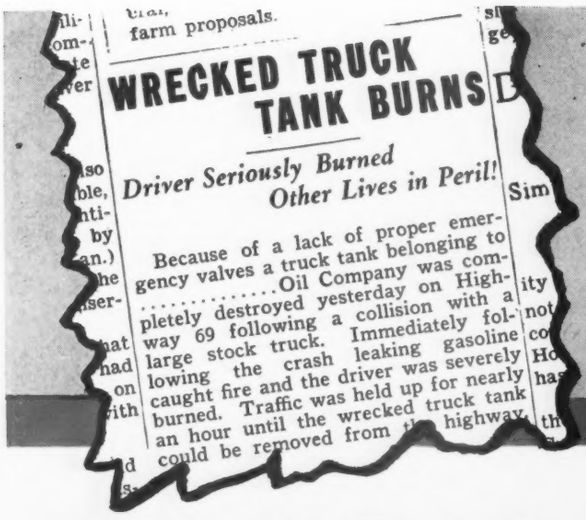
farm proposals.
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K. S. ADAMS

K. S. Adams, new executive vice-president of Phillips Petroleum Co., was treasurer and assistant to the president before his election to the second highest position in the company. He has rounded out 18 years service with Phillips.

He began his oil career in the warehouse and materials department in 1919, served in various capacities in the producing department and the accounting department and was made assistant to President Frank Phillips in 1932. Mr. Adams is a graduate of the University of Kansas and served in field artillery service during the War.

LAST MINUTE
OIL NEWS SECTION

News By Teletype From 4 News Bureaus

National Petroleum News

News From Oil Industry Everywhere

VOLUME 29 WEDNESDAY, DECEMBER 15, 1937 NUMBER 50

Defense Version Of Buying Given In Madison Case

By Teletype
N. P. N. News Bureau
By A. M. PETTY

MADISON, Dec. 14.—Major company buying of "distress" gasoline from independent refiners in the Mid-Continent area was pictured as part of the general stabilization program under the NIRA oil code, in testimony today of Robert W. McDowell, Tulsa, vice president of Mid-Continent Petroleum Corp., a defendant in the alleged conspiracy case.

McDowell told how he was appointed chairman of the "Tank Car Stabilization Committee" by C. E. Arnott, vice president, Socony-Vacuum Oil Co., Inc., chairman of the marketing sub-committee under the code.

He said Arnott was "known among us as chief stabilizer as a result of Secretary Ickes' letter," referring to the Ickes-Arnott stabilization letter of July 20, 1934, which was barred from evidence by U. S. Judge Patrick T. Stone after a prolonged argument Dec. 13.

McDowell denied the buying "plan" was a price-fixing scheme, although he said it was suggested that the major companies pay a fair, going market price for the gasoline they purchased.

Defense Charts Prices

Highlight of last week's defense testimony was the presentation of audits of sales by major companies and independent refiners made by W. F. Weiss & Co., New York firm of certified public accountants.

Charts were put in indicating that trade journal quotations were supported by actual sales to jobbers in 1935, with nearly as many sales above the "high" as below the "low" of the published price range.

Other charts showed that prices paid by major companies in their purchasing during the spring price rise of 1935, called "the golden stairs," by the prosecution, were below the trade journals' "low"; lagging behind,

(*Continued on page* 12)

64 Work 1360 Years

CHICAGO, Dec. 13.—Sixty-four employes at the Whiting (Ind.) refinery of the Standard Oil Co. (Indiana) are 65 years old or over and have a continuous aggregate service of 1360 years, the refinery management said today. Standard officials have been compiling a list of men eligible for pensions.

Twenty-eight of the 64 have over 20 years service, 12 have over 25 years service and four have over 40 years of service. The longest number of years of service among the men on the list is 46, credited to a 65-year-old employe.

"Believe It or Not"

CHICAGO, Dec. 14.—He has red hair, is a scout for the Red Birds, of St. Louis, and sells Red Crown gasoline in Red Bud, Ill., So "Red" Burgdorf received a letter from "Believe It Or Not" Ripley, asking for a snapshot to use in his cartoons, So says the publicity department of the Standard of Indiana.

Rail Increase May Turn Oil to Trucks, Pipelines

Changes In Refinery Marketing Areas To Result Also

N. P. N. News Bureau
By ALLEN S. JAMES
N.P.N. Staff Writer

TULSA, Dec. 13. — Traffic managers for Mid-Continent refiners, while preparing to oppose, as far as oil is concerned, the railroads' petition for a 15 per cent increase in their freight rates, are also studying the further use of gasoline pipelines and the increased use of long distance trucking, in the event large rate increases are allowed the railroads.

A plan for another group gasoline pipeline into middle western marketing territory, which had been temporarily shelved a few months ago, is again being given serious consideration. The plan is said to have the favorable support of some of the pipe mills, as far as the financing of the bill for materials is concerned.

It is also understood that two major oil companies not at present owning any gasoline pipeline facilities from the Mid-Continent are also now considering either their own separate project, or seeking to become a part of the group which now has a new line under consideration.

There are at present four pipeline systems which move gasoline from Mid-Continent refineries, the largest that of the Great Lakes Pipe Line Co., extending as far north as the Twin Cities. Eight refiners participate in this line. All told the four systems from the Mid-Continent operate close to 3000 miles of trunk pipeline.

Not only in the Mid-Continent have the refining companies turned to pipelines to offset disadvantageous railroad rates in the transportation of their principal product, motor fuel. Over the country at large, some 20 oil companies operate 10 pipeline systems, with about 5000 miles of pipeline, and moving about 5,500,000 gallons of gasoline daily, about eight per cent of the nation's motor fuel supply.

Use Trucking Also

Mid-Continent refiners have also been able to extend their marketing territories in the past beyond the natural barrier of the freight rate structure, through long distance transport trucking, hauling into Nebraska and Colorado, as well as other equally distant points.

Advances in freight rates, unless they are equally balanced by increases in trucking rates, will undoubtedly see the refiners making greater use of this transportation facility.

Plans for presenting the Mid-Continent refiners' opposition to the proposal of the railroads to increase rates 15 per cent are

With 1937 Oil Demand At Peak Industry Raises Sights For '38

N. P. N. News Bureau

NEW YORK, Dec. 14.—Despite a 10.5 per cent increase over 1936 in crude runs to stills, the oil refining industry produced barely enough to meet the demand in 1937 for all petroleum products, an analysis today of American Petroleum Institute statistics indicated. They are contained in year-end statements made by Axtell J. Byles, president of the institute, and Baird H. Markham, director of the American Petroleum Institute Committee.

The nation's 30,000,000 motorists used their vehicles to a greater extent than ever before, consuming more than 22,000,000,000 gallons of motor fuel. This volume was sufficient, the A. P. I. estimated, to propel the vehicles an aggregate distance of 330 billion miles, or about 80 billion miles farther than estimated travel in 1931, the pre-depression peak year for highway travel.

"Relatively stable crude oil prices and continuing large production brought a measure of prosperity to the oil producing areas," the institute commented. "Domestic crude oil production for 1937 was estimated at 1,280,000,000 barrels as against 1,098,516,000 barrels in 1936, until now the all-time peak year."

The number of dry holes compared to the total number of wells completed in 1937 remained proportionate to 1936. Some 18,500 oil wells were completed in 1936 and 23,700 oil wells in 1937. Oil, gas and dry holes in 1936 totaled 25,890. Of this total, 5297 were dry holes. Dry holes in 1937 were 6300 out of a total of 32,500.

The crude oil produced in 1937, 1,280,000,000 barrels, brought the industry about a

(*Continued on page* 16)

to be formed at a meeting here Dec. 14, preceding the regular meeting of the Tulsa Traffic Club.

From Washington comes word that the Western Petroleum Refiners' Assn. will participate in the hearings before the Interstate Commerce Commission in Washington, and that the southwestern independent refiners will be represented at the hearing before an ICC representative in New Orleans Jan. 10.

There appears to be little doubt among traffic men in the Mid-Continent but that any increase in rail rates will be followed by an increase in truck transport rates. How much the truck operators would increase rates, however, is the important question.

Debate Truck Rates

If the truck operators should elect to increase rates the same amount as the railroads, there is some doubt among traffic men that the percentage of petroleum products hauled by transport truck would increase greatly. On the other hand, if the truck operators increase rates only a fraction of the amount the rails might be granted, the refinery traffic men believe more petroleum products would be handled by truck, and the hauls would be stretched out considerably.

Transport truck operators, meanwhile, have been quoted as saying that since they have been placed under the control of the I. C. C. their costs have increased to the point where they are barely "getting by" at under their present rates. Only the hardiest of the lot, they say, are keeping their heads above water.

It will be recalled that earlier in the year a group of refiners in the Mid-Continent authorized a firm of engineers to make a preliminary survey for a gasoline pipeline into the middle western marketing area. About the time the report by the engineers was submitted the stock market was given a severe jolt. The project was shelved temporarily.

Gasoline Pipelines?

Since the proposed increase in rail rates has been laid before the I. C. C., these refiners have taken the project off the shelf, dusted it, and are giving it another inspection. The financing, it is reported, would be a comparatively easy matter if rail rates should be increased. There is also the report that one or more of the major pipe manufacturers have offered to supply the material and not even present an invoice until after the line has been placed in operation.

Then there is the unconfirmed, but generally accepted, report that two major companies not now members of any gasoline pipeline group from the Mid-Continent, are considering seriously such a project and that their consideration has been intensified by the proposed increase in rail rates.

These two companies, one traffic man has said, already have told the group of refiners studying the community pipeline project that they would like to be given the opportunity to join in that program; otherwise they will continue to give serious consideration to the construction of their own line.

If these tentative pipeline plans should materialize, with the two large companies joining with the other refiners, it will undoubtedly mean that the marketing territory east of the Mississippi will be opened to more independent refiners in the Mid-Continent; that more petroleum products will be moved by barge on both the Missouri and Mississippi rivers; that marketing areas may undergo noticeable realignment.

Unless the companies now operating gasoline pipelines from the Mid-Continent change their present policies, any increase in rail rates will result in a corresponding increase in the pipeline tariffs. The pipeline companies, it will be recalled, apply the Group 3 rail rate on all deliveries to bulk plants of members located in the middle western marketing area.

Increased Freight Bills

It might be interesting, meanwhile, to study a few specific marketing destinations in the middle west just to see what a 15 per cent increase in rail rates would mean. In the accompanying table 10 cities have been selected at random. The present Group 3 rates, in cents per 100 pounds and in cents per gallon for both light and heavy oils, are compared with rates that would be applicable in the event of a 15 per cent increase.

While it is true that the facts and speculations cited above are confined to the Mid-Continent, there is little doubt in the minds of traffic men who have studied the railroads' proposal that increases in rail rates of anything like the extent the railroads are asking would cause readjustment in the movement of petroleum products in many sections of the country.

The traffic manager for one large independent refiner in the Mid-Continent, in discussing the proposed rate increase, expressed the opinion that the I. C. C. should also give some attention to a revision in operating methods of the railroads. He cited as a specific example that he could ship a tank car of gasoline from one of his plants in Texas to Minneapolis, and route that tank car over 12 different railroads, and not one of those roads would derive enough revenue from the handling of that car to pay operating costs. On the other hand he could route that same car over only two roads and both lines then would be able to show some profit on the haul.

Marketers Principal Sufferers If Freight Rates Are Jumped

N. P. N. News Bureau
By G. T. KELLOGG

WASHINGTON, Dec. 13.—Petroleum's $37,000,000 share of the 15 per cent additional rate increase sought by the railroads will probably be paid in large part by the jobber of petroleum products if the Interstate Commerce Commission grants the higher rates.

Paul E. Hadlick, secretary of National Oil Marketers' Assn., estimates that 75 per cent of all rail freight charges on petroleum products—which brought the railroads $250,000,000 in revenue in 1936—are paid by jobbers, either directly or indirectly.

The same percentage, applied to the $37,000,000 which would be added to the anual petroleum freight bill, would make the jobbers' share of the added rates about $27,750,000.

These figures are based on Hadlick's estimate that at least half the petroleum products marketed in the country moves through jobbers, but that only a small portion of the other half, marketed by the major companies' own distribution facilities, moves by rail.

But this is not the end of the added costs to the jobber if the increased rate should be granted—and it appears likely that some sort of increase will be allowed. With the new rates in effect via rail, the transportation cost to jobbers who buy f.o.b. group 3, the Gulf, or other producing or refining districts, will likewise go up, even though their supplies reach them by pipeline, by trucking or by water movement, it is expected.

Truckers Ask Increases

No maximum rate orders are now in effect for pipelines, although the ICC has before it a proceeding contemplating issuance of such orders.

Common carriers on the inland waterways have joined in the rails' application for the higher rates. Common carrier truckers have said they will seek increases in their rates if the rail increase is granted. There are no maximum rate orders extant for truckers, either, so all that will be necessary for them is the filing of tariffs setting up the new and higher rates.

No figures are available as to what jobbers pay annually for common carrier truck transportation of petroleum products. The jobbers use common carrier trucks in hauling from seaboard and river terminals and refineries to points within a radius of a few hundred miles, in some cases.

Many jobbers receive their supplies by contract carrier truckers whose contracts are kept on file at the Interstate Commerce Commission—if their operations are interstate. It is logical that these contract rates will go up also, along with those

Comparison of Present Group 3 Rail Freight Rates to Ten Middlewest Cities With Rates That Would Apply if the Rail Carriers' Petition for 15 Per Cent Increase Should Be Granted

From Group 3 To	Rate In Cents Per 100 Lbs.		Rate In Cents Per Gal. Light Oils			Rate In Cents Per Gal. Heavy Oils		
	Present	Proposed	Present	Proposed	Increase	Present	Proposed	Increase
Chicago	37	42.5	2.442	2.805	0.363	2.738	3.145	0.407
St. Louis	31	36	2.046	2.376	0.330	2.294	2.664	0.370
Omaha	34	39	2.244	2.574	0.330	2.516	2.886	0.370
Madison, Wis.	43	49.5	2.838	3.267	0.429	3.182	3.663	0.481
Memphis	34	39	2.244	2.574	0.330	2.516	2.886	0.370
Kansas City	26.5	30.5	1.749	2.013	0.264	1.961	2.257	0.296
Sioux City, Ia.	37	42.5	2.442	2.805	0.363	2.738	3.145	0.407
Indianapolis	45	52	2.970	3.432	0.452	3.330	3.848	0.518
Minneapolis	43	49.5	2.838	3.267	0.429	3.182	3.663	0.481
Duluth	48	55	3.168	3.630	0.462	3.552	4.070	0.518

of common carrier truckers, if the rail increase goes through.

"In Desperate Need"

Chester G. Moore, secretary of the American Trucking Assns., Inc., told the ICC during the current hearing on the rate increase that the trucking industry—which includes contract as well as common carriers—is "desperately in need of more revenue" because the margin between income and expenses has narrowed until it has reached "the vanishing point."

Moore estimated that an increase in gross revenue of about 20 per cent was needed to place the trucking industry in a proper economic condition to allow carriers to maintain proper service, "although I realize that inasmuch as the railroads have applied for only a 15 per cent increase that is about all we can expect to get for competitive reasons," he added.

Differs from Earlier Case

The increase which the railroads are seeking in the present case, known as *Ex Parte* 123, differs from the increases granted late in October. In that proceeding the rails asked authority to file tariffs increasing certain rates beyond currently existing maximum rates, but specified that they did not wish to increase rates which had been lowered to meet truck or water competition.

In the present instance the railroads ask the ICC to "make" a blanket increase of 15 per cent in all existing freight rates, with exceptions for certain commodities, whether the present rates are competitive or otherwise. Thus, if granted as sought, the same relationship between competitive and non-competitive rates will be maintained, but both will be on a higher level.

In all probability the rails will later come back in individual instances to the ICC and ask to file lower rates in some cases to meet carrier competition, but that is not involved in this case.

Shippers Opposing

This "blanket" increase was attacked on the witness stand before the ICC hearings last week by R. C. Fulbright, chairman of the committee of shipper representatives, who said the railroads were throwing away a million dolars a day in maintaining depressed rates which they and competing agencies could increase without reference to the proceeding before the ICC, since they were below the maximum reasonable rates fixed by the commission.

Fulbright said the rails, who were attempting to rush the commission in the pending proceedings and to place all responsibility on it without regard to the rudimentary requirements of a fair hearing for shippers, should be compelled to make a full showing of the extent to which they were losing revenue through these voluntarily depressed rates.

However, most of the testimony given so far in the hearing would seem to indicate that opposition to the proposed increase is not going to be either loud or long. It is apparent that many shippers are in substantial agreement with the rails' chief contention—that operating expenses, wages, material, and so on have grown so large that additional revenue is needed to pay them and still make a return on investment.

So far as can be learned, no petroleum shippers are scheduled to appear at the current hearings in Washington, and it was indicated here today that the National Oil Marketers Assn., the Independent Petroleum Assn. of America, and the National Petroleum Assn. plan to take no part in the presentation of opposition testimony, as associations.

Testimony will be offered by the oil industry at subsequent hearings, however, it was said. The Southwestern Independent Refiners plan to be represented at the hearings on the case in New Orleans Jan. 10, and the Western Petroleum Refiners Assn. will take part in the final hearing in Washington on Jan. 17, according to present plans. Harry S. Elkins, traffic counsel for the National Petroleum Assn. is representative of petroleum shippers on the shippers' committee.

An attempt on the part of the carriers to have the case decided at the end of last week, following presentation of only carrier evidence, was halted by the ICC's decision to go ahead and hear the case through to its conclusion. The commission, however, did move up the hearings scheduled in cities outside Washington so that they will be concluded by Jan. 17—about three weeks earlier than was previously planned—in order that it may be able to reach a decision sometime in February, it is anticipated.

Kansas Declines Bid To Meeting Of Oil Probers

BUFFALO, Dec. 13. — Twenty-four states today had accepted invitations to attend a joint conference of state agencies with regulatory authority over the oil industry at Chicago Dec. 20 and 21 but only one important producing state was among the 24.

Pennsylvania was the producing state which replied to the New York Joint Legislative Committee to Investigate the Petroleum Industry, sponsor of the conference.

No replies have yet been received from Oklahoma or Louisiana and Kansas declined to attend. Texas and California sent tentative acceptances.

Harold B. Ehrlich of Buffalo, chairman of the New York committee, said he thought it possible this delay was occasioned by the calling of an interstate conference by Governor Ernest W. Marland of Oklahoma. The announced purpose of Marland's conference, however, was a stabilization of crude oil prices.

Topics of Meeting

Questions which will be discussed at the Chicago meeting of state authorities, as announced by Ehrlich, include:

Are there any combinations in the oil industry working to the detriment of the public interest?

What has been the effect of the Connally act, prohibiting the interstate shipment of "hot" oil, on prices of petroleum products in consuming states?

Is the oil industry so affected with the public interest as to justify its regulation as a public utility; or as a quasi-public utility?

What determines a fair price for petroleum products and has the public been paying a fair price?

What are some of the obstacles to state regulation of the oil industry?

What are the advantages of state specifications for grades of gasoline and to what extent can such specifications be standardized among the several states?

What methods of co-operation are possible among states regulating the oil industry?

List of States

The 24 states which so far have agreed to attend the joint conference in Chicago are as follows:

Indiana, Illinois, Wisconsin, Ohio, Virginia, Pennsylvania, North and South Carolina.

Michigan, Arizona, Connecticut, New York, Rhode Island, Iowa, Alabama and New Jersey.

Maryland, Wyoming, Missouri, Massachusetts, North Dakota, Minnesota, West Virginia and Nebraska.

The meeting will be held at the Edgewater Beach Hotel, in Chicago.

Berg Will Head Calif. Standard

N. P. N. News Bureau

LOS ANGELES, Dec. 13.—When a Standard Oil executive dies there is a tradition which says a new office boy must be hired. This tradition was followed when the directors of Standard Oil Co. of California Dec. 9 elected William H. Berg president, to succeed K. R. Kingsbury, who died Nov. 22.

This new chief executive's career is typical of that of many Standard Oil high officials. He joined the company in 1902 as a stenographer. He was 20 years of age then and had just moved to California from his native state of Iowa.

During the following 35 years his business activities have been devoted solely to this company's activities. From the bottom rung of the ladder he steadily progressed through various departments until 1908, when he entered the producing branch of the company's business.

His ability in this direction was recognized in 1921 by his appointment as general manager of the company's foreign crude oil producing department, a position he held until February, 1924, when he was elected a director. He has served continuously as a director and in 1927 was made a vice president.

In view of the company's world-wide expansion in producing and marketing activities, particularly the former, which will see further development in Java, Sumatra, and along the Persian Gulf, Berg's selection to the presidency is considered most appropriate because of his past experience.

The company is also faced with expropriation of a large part of the holdings in Mexico, and, although this is a matter for the Mexican government to handle, it nevertheless remains a problem to the California company.

At the time his election as president was announced, Berg was in the east to witness the launching of a new Standard Oil of California tanker built by Sun Shipbuilding Co. Of interest is the fact this vessel will be christened the William H. Berg.

NEW YORK, Dec. 13.—Ralph C. Champlin has been elected a vice-president of the Ethyl Export Corp., foreign subsidiary of the Ethyl Gasoline Corp. Since joining the Ethyl organization early in 1937, he has been chairman of the co-ordinating committee.

Defense Version Of Buying Given In Madison Case

(*Continued from page 9*)

instead of leading, the market, defense counsel emphasized.

The dismissal motion of R. O. Audrain, Tulsa, of Tide Water Oil Co., was granted by Judge Stone, who at the same time denied the motions for all other individual defendants not acted upon.

Called as a defense witness, James A. Moffett, New York, of California-Texas Oil Co., was blocked from testifying about his visits to the White House and conferences with President Roosevelt on oil matters.

Two defendant companies, Pure Oil and Sinclair Refining, put on officials of their respective companies as witnesses.

Pure Oil Purchases

Opening the Dec. 8 morning session of the Madison trial, L. S. Wescoat, Chicago, vice-president of Pure Oil Co., with the aid of a 12-foot wooden scaffold and a series of varicolored charts, told about Pure's gasoline production, inventories, sales, and crude production. Pure produces only 70 per cent of its crude reqquirements, he said.

Besides gasoline obtained through its processing contracts, Pure also has to buy considerable quantities of gasoline, Wescoat added. He explained that "processing contract" meant an arrangement whereby Pure furnished crude oil to another refiner who processes it at a fixed price per barrel, returning to Pure a fixed amount of gasoline, and, in some cases all or part of of the residue products. If the residue products are not returned, then the processing refiner pays Pure the market price for those products at the time the gasoline is delivered.

During 1935-36, Pure bought no third grade gasoline from independent refineries in either the Mid-Continent or East Texas at a flat price higher than the low quotations in the trade journals for the respective markets, according to Wescoat.

On cross-examination, Government Attorney Lewin brought out that, besides these flat-price purchases, which were mostly at the "low," Pure also purchased gasoline at prices based on the "low" of the published prices. These were not shown on the chart, Wescoat explained, "because they were not spot sales."

First witness of the afternoon session Dec. 8 was Porter Langfitt, in charge of Pure Oil's refineries, who testified that Pure's plants operated at maximum capacity in 1935-36, except when the refinery control program was in effect.

Pure has processing contracts with Gulf Oil Co., Standard of Louisiana and Standard of Ohio, Langfitt testified.

Van Covern of API

Fred Van Covern, New York, of the American Petroleum Institute, who was loaned to the oil industry's Planning and Coordination Committee during the oil code period, was next called to the stand to identify a telegram from C. B. Watson, of Pure, to Van Covern regarding the voluntary curtailment of refinery runs in 1935.

Government attorneys insisted that their objection to the telegram from Watson, a defendant, was that the prosecution would have no opportunity to cross-examine the sender. Their objection was sustained.

Gasoline production and sales figures of Vickers Petroleum Co., Wichita, Kans., were put in by stipulation.

Similar data was presented for their respective companies by A. L. Reid, Shreveport, of Root Petroleum Co., and D. R. Grable, Oklahoma City, of Anderson-Prichard Co. and Col-Tex Refining Co., who appeared as defense witnesses.

Government attorneys objected to the Root testimony on the grounds that Root was not named in the indictment. Donovan replied that the defense was preparing to show that the defendant companies not only had not purchased "more than 50 per cent" of the output of independent refiners listed in the indictment, but that the defendants could not have controlled the market, even so, because there were other independent refiners who were not listed.

Grable, questioned by government counsel, denied that Standard of California had any connection with, or controlled in any way, Anderson-Prichard.

Next witness called was James D. Miller, Bronxville, N. Y., partner in W. F. Weiss & Co., New York firm of certified public accountants, who testified, using a 12-foot chart, as to Danciger's sales on the spot tank car market.

Miller compared Danciger's sales to jobbers and consumers at flat prices on a Group 3 basis for shipment within 15 days, with the composite price quotations in the Chicago Journal of Commerce and Platt's Oilgram covering date of purchase. Contract sales and sales based on publications were excluded.

There were 538 such sales by Danciger, mostly all to jobbers with the balance to consumers, during the period from November, 1934 to December, 1935, according to Miller's testimony. Of these sales, 84 were above the composite high; 47 at the high; 24 within the range of the high and low; 294 at the low; and 89 below the composite low.

From November, 1934, through February, 1935, the four months preceding the price rise which, the prosecution has called "the golden stair," the Danciger chart showed 7 sales above the high, 12 at the high, 10 within the range, 53 at the low, and 36 below the low.

For the "golden stair" period, March, April and May, 1935, there were 134 sales, of which 11 were above the high, 20 at the high, 10 within the range, 76 at the low and 17 below the low, the Danciger chart showed.

Donovan brought out that there were fewer sales below the "low" during the price rise, than in the preceding months.

Sales To Majors

Turning to Danciger's spot sales to major companies, Donovan brought out instances when third grade was sold to a major company at, for example, 4.5 cents, which followed by several days spot sales to jobbers at from 0.125 to 0.25 cent above that price.

Miller testified that for the greater part of 1935, Danciger's prices to majors were at or below the company's prices to jobbers.

Purchases from Danciger by seven of the defendant major companies totaled 195 cars in 1935, with the quantity varying from month to month and the total purchases of the companies ranging from 1 car to 95, Miller said.

Some majors bought at flat prices, others at prices based on publications.

The Danciger chart, showing spot sales of regular, as well as third grade, was a huge affair, with the trade journal quotations plotted and each sale marked by a dot, colored differently to show sales to jobbers, consumers and major companies. It was admitted in evidence.

On cross-examination, Chaffetz sought to show on the chart that a line drawn through the major-company purchases would correspond with the low of the trade-journal quotations during the "level" period in 1935.

Asked if he had taken into consideration "special arrangements" between the refiner and buyer, Miller replied that the general practice, wherever the price on the purchase order appeared out of line with the market, was to take it to the sales department of the company being audited and ask if there was any "arrangement."

If there was an "agreement" between the refiner and jobber, even an oral arrangement, the sale was excluded from the tabulation because purchases or shipments under contract were not regarded as "spot" sales, Miller added.

Opening the Dec. 9 sessions, Judge Stone announced that he had concluded his consideration of motions of certain individual defendants for directed verdicts of acquittal and was of the opinion that all should be denied except that of R. O. Audrain, Tulsa, described in the indictment as a buyer for Tide Water Oil Co.

"The defendants," Judge Stone continued, "may, if necessary, by proper motions after verdict, seek the same objectives that they have sought in their motions for a directed verdict. We all understand that. But in the present state of the record, the court is of the opinion that the government is entitled to have the issue in this case submitted to the jury."

Apparently, the words "proper motions after verdict" referred to motions to set aside a verdict as to certain defendants—if and when the jury finds such defendants guilty. However, motions for directed verdicts of acquittal probably will be renewed when all the evidence is in and before the case goes to the jury.

Mid-Continent's Purchases

Miller, the accountant witness, then resumed the stand to testify as to purchases of Mid-Continent Petroleum Corp. from independent refiners and brokers in 1935. A chart, with prices of open spot market purchases plotted against the trade journal quotations, was used and later received in evidence.

Asked by Donovan if Mid-Continent's purchase prices "led" or "followed" the market, the witness replied that they "followed it consistently," lagging behind the price rise of the spring of 1935.

For the balance of 1935, Miller said, "the majority of the prices were below the low; but as the market steadied there were more purchases made at the low than during the period of the price rise."

All but four of the 691 cars of third grade purchased at flat prices were either at or below the "low," but these four were bought on a basis of trade journal price quotations, according to Miller's testimony.

Besides these 691 cars, 10 others were bought on a publication basis and therefore not included on the chart, Miller testified on cross-examination.

Asked by government counsel how many of Mid-Continent's purchases were made in the "buying program," Miller replied: "I am not familiar with

Accountant Tells of 'Errors' in Chart

any buying program."

Miller next testified as to a tabulation of purchases of third grade gasoline on a flat-price basis in March, April and May, 1935, from independent refiners by all the defendant major companies—except Sinclair, "because the government was using Sinclair's records," he added.

Prices paid by the major companies not only varied from day to day, according to Miller, but there were days on which as many as five major companies bought at four different prices.

At the start of the afternoon session Dec. 9, Miller resumed his detailed testimony about these purchases, day by day.

Then, the defense witness turned to some of the statistical data put in by the government.

Of 53 cars which Miller said the government contends were bought at flat prices above the trade journals' "low," there were "mistakes" in the classification of 48 cars, he said. Of the five remaining cars, one was of higher specifications, usually commanding a premium over the third grade price, while the other four were over the low of the Chicago Journal of Commerce but actually at the low of *Platt's Oilgram*, he added.

There were five classes of "errors" in the government's handling of these 53 cars, according to Miller, the "most serious" one being ignoring f.o.b. Group 3 basis.

Four "errors" were made in the handling of a one-car purchase by Barnsdall, it was claimed, including classification as an "East Texas" purchase when, Miller stated, it was actually bought from a Tulsa broker and shipped from Oklahoma City, according to the defense witness.

The defense next called James A. Moffett, New York, now chairman of the board of California-Texas Oil Co. and formerly vice-president of Standard of New Jersey, who, under Donovan's questioning, told about his appointment by President Roosevelt as a government representative on the P. and C. Committee and, later, as federal housing administrator.

Government counsel objected to Donovan's questions about Moffett's visits to the White House in 1933 and his conferences with President Roosevelt. With the jury excused, Donovan told what Moffett would have testified to, including statements about the President favoring the fixing of oil prices by the government.

Judge Stone sustained the objections and Moffett was excused without cross-examination.

Sinclair Witness

Last witness of the day was Samuel W. Everett, Valhalla, N. Y., chief statistician for Sinclair Refining Co., who testified, with the aid of a large chart, as to Sinclair's gasoline sales, production, purchases, inventories and other statistical details from 1931 to 1936, inclusive.

Opening the morning session Dec. 10, G. C. Lilly, Winnetka, Ill., secretary of Johnson Oil Refining Co., and John D. Bright, Vernon, Texas, chief accountant of Waggoner Refining Co., testified briefly as to gasoline production and sales of their respective companies.

Creed B. Batson, Tulsa, of Mid-Continent Petroleum Corp., identified statistical tables of that company's 1935-36 sales other than under contract, which were put into the record.

Next to testify was C. A. Carlson, Cushing, Okla., accountant of Cushing Refining and Gasoline Co.

Sales to jobbers and brokers, virtually all of which were on the spot market, constituted over 84 per cent of Cushing's total gasoline sales in 1934, nearly 90 per cent in 1935 and over 86 per cent in 1936, Carlson testified.

Cushing's sales to major companies were larger in 1934 than in 1935, Donovan brought out.

On cross-examination, Lewin brought out that Cushing sold Shell Petroleum Co. 175 cars in the last ten months of 1935 and 410 cars in 1936.

Shell Purchases

Miller, the defense accountant witness, then resumed the stand. He testified as to an audit of Shell's purchases from Jan. 1935, through April, 1936, from independent refiners on an f.o.b. Group 3 or f.o.b. Oklahoma refinery basis. His tabulation was limited to flat-price purchases of third grade and regular, excluding intermediate bracket and premium material and purchases based on publications.

Shell's purchase prices lagged behind the market in the price rise in the spring of 1935, with all below the low, Miller testified. During the entire 1935-36 period covered, Shell bought 174 cars, according to the tabulation; and of these, 149 were at the low and 25 below the low, he added.

On cross-examination of Miller, Lewin brought out that Shell had made a number of purchases from Cushing of 65-70 octane at the low of the Chicago Journal of Commerce for "regular" grade. The government attorney insisted that this was paying a "premium" for this type of material because it was not up to specification for "regular" grade.

Donovan, on redirect, pointed out that Miller had testified at the start that such purchases were not included in the chart because the trade journals, up to April, 1936, were not carrying a bracket for such intermediate octane material. Miller also explained that it was impossible to chart prices of sales based on publication quotations because, at the time of the sale, the buyer and seller do not know what the sale price will be.

Deep Rock Sales

Miller next testified as to an audit of flat-price sales by Deep Rock Oil Corp., excluding those on contract or oral agreement, or based on publications, of third grade and regular to jobbers and industrial consumers. He pointed out that Deep Rock also made premium grade and other materials of special specifications which were not included on the chart, which was later admitted in evidence.

Of the 334 third grade sales from Jan. 1, 1935, to April 30, 1936, 14 were above high of the trade journals, 79 at the high, 31 within the range, 168 at the low, and 42 below the low, according to Miller's testimony.

There were 241 sales of regular in the same period, of which 11 were above the high; 143 at the high, 40 within the range, 27 at the low, and 10 below the low, Miller testified.

Court then adjourned for the week-end recess.

Defendant Takes Stand

Robert W. McDowell, Tulsa, vice-president of Mid-Continent Petroleum Corp., took the stand at start of the Dec. 13 sessions — the first defendant to be called as a witness.

Guided by Donovan's questions, McDowell told how he started in the oil business, becoming general manager of Hawkeye Oil Co., a jobbing company of Waterloo, Iowa,

(*Continued on page* 21)

IN NEXT WEEK'S N. P. N.

"No Greaseballs Here"

By JOHN W. THOMPSON

• So one eastern local oil marketing company advertises its car lubrication service. Its patrons cheerfully pay a good price to have their cars greased at its stations, because of the training given the operators and the equipment supplied them. This same company has found other means to establish itself as a factor in the business life of the community—and thereby it gets business. How is it done? Read the special article in the Dec. 22nd issue of NATIONAL PETROLEUM NEWS.

Montana Refining Conscious

By JACK WESTSMITH

• The rapid strides being made in this state in the modernization of plants of independent oil companies have brought the refining industry there into favorable public notice. And the public is responding by buying home products in greater volume. Good roads and more touring help increase the demand for quality motor fuels. Facts and observations by an N.P.N. Staff Writer who recently visited the Montana oil industry.

The 1937 Crop of Oil Laws

• Five states increased motor fuel taxes this year. Twenty-seven bills were enacted in 16 states affecting diversion of motor fuel tax funds from highway purposes, etc., etc. A concise, yet comprehensive summary, Mr. Reader, of state legislation enacted this year affecting our industry—and something you are quite likely to file carefully away and refer to when the 1938 legislatures start shooting.

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To Oilman Kingsbury—Builder

One does not like to say a company is a monument to a single man. That seemingly disparages all the others who helped build it. But a company can be built by one man, can be a one-man company, so to speak, during that man's lifetime and then can be a great and lasting monument by reason of the men whom the builder gathered around him and who carry on after he is gone. So, if his associates of all these years will forgive me the eulogy of the man, then I shall say that the Standard Oil Co. of California is a great monument, in public service, in oil fields and refineries, in tanks and in ships, in dollars and in men, to its late president and builder, Kenneth R. Kingsbury. It will be a lasting monument to him by reason of the men who gathered round him and the principles on which they all built.

Much has been said and written about the romance in the oil industry, but men and events have come and gone so rapidly in the industry's relatively short history, that we in it hardly pause, even on the departure of its leaders, long enough to see who they have been, where they came from and what they have done. Certainly we give little thought to our oil men until after they are gone.

So we might pause a little and take a second look at Mr. Kingsbury, the oil man. It would not only be his due but it might even be fairer to our industry and ourselves, for everywhere one turns in this big industry of ours are Kingsburys, Kingsburys in high places and Kingsburys in small jobs, yes, and Kingsburys-to-be newly arrived in the industry.

If there ever was a business where men themselves built an industry out of their own labors and their own minds and their own spirits, it's this oil industry. Certainly "inside pull" has been absent. That has been true from the big companies down through the small companies. A man has what he has in the oil business because he is entitled to it by his own efforts. It has not been handed to him on a silver platter. So it was with Mr. Kingsbury.

There are more Horatio Alger stories—stories of the rise of individuals from lowly place—in the oil industry than we can keep track of. Every oil company in New York or in any far western town has the material for one. These oil men came from everywhere except from homes with footmen at the doors. I know many a "big oil executive" today who had not much more than the shirt to his back when he started and with some of them that shirt was pretty worn and dirty. Many big executives never got to college, many never finished high school and some did not even complete the grammar grades.

While Mr. Kingsbury was fortunate to be among the few who managed a college education, he had strong hands, a strong back and good feet and he used them in the small jobs of the oil business when he started his career.

Probably due to the lowly bare-fisted training of these oil men, the industry does not hesitate to fight, fight with outsiders and fight between its various groups and individuals. In Mr. Kingsbury we can see all these traits of a typical oil man, for he was a good fighter, and a fighter who generally won too.

As we stop to get a better look at Oilman Kingsbury and the job he did, we see around the circle the tens of thousands of faces of all the other fighters and builders of oil businesses, big and little. One cannot help but wish we might all give more time to looking at each other, and to realizing more clearly that the other man is just the same kind of an oil man, one who has fought hard for every bit of life's benefits and who owes his job and his business to no one but himself—a typical American.

The need for such clearer vision is heightened by what one sees outside of the oil industry, in the growing problems with government and society in general. There is much that Oilman Kingsbury did and stood for that every oil man could study for his own and the industry's good. His achievements should be a guide to oil's builders of tomorrow.—W. C. P.

Why Not Close the Libraries To Keep Workers' Minds "Pure"?

It probably won't be long now until our solicitous National Labor Relations Board will order the closing of all public libraries in the neighborhood of any labor dispute. At least it should close those endowed by capitalistic money, such as the Carnegie Libraries.

If the board does not close the libraries forthwith then it surely will hail the librarians before it and ask if they do not know that they are exposing books of propaganda at the instigation, or perhaps only with the knowledge and consent of the employers of the neighborhood for the purpose "to discourage workers joining a free union."

There has been much clamor by labor leaders and the board about facts of life that may be compiled with capitalistic money and given to the workers. Only a labor union or some alleged civil liberties outfit that would make itself the sole censor of these liberties, can supply these facts to the workers, it seems.

Now comes the labor board in a statement of its chairman, and says that all it wants to know in subpenaing the editor of Mill & Factory—the trade paper that recently severely criticized the board's "trial" of the Weirton Steel dispute—is whether the steel company was distributing reprints of this article "to discourage steel workers joining a free union."

How would the editor know what the steel company was doing with the reprints? Aside from that, the labor board chairman's statement raises the point if the board does not believe that any information whatsoever that may have any bearing, in even the most remote way, on the fundamental economics of business, in a labor dispute, should not be distributed to the workers by the employer at any time?

What the board has said and done and what the proponents of the Wagner labor law have said suggest justification for this suspicion.

Since an employer cannot discuss labor problems with his employes, as plainly seems to be the position of the board, and if an employer cannot circulate reprints or other information concerning labor problems, then a little practical question suggests itself. How soon is this czaristic board going to forbid employers to subscribe to business papers for their employes just because the business papers discuss labor problems and matter relating thereto in their pages and so frequently from the employer's viewpoint?

Ditto for newspapers and magazines?—W.C.P.

Tomorrow's Refining Equipment On Display at Chemical Expo.

By ARCH L. FOSTER
Technical Editor

NEW YORK, Dec. 13. — No man interested in the progress of the chemical and the engineering industries in America — oil included — can get a more complete instantaneous, and astounding a diorama of the nervestraining pace being set in these fields in America than strikes the eye and mind in viewing the 16th Exposition of Chemical Industries which was held here last week.

The myriad items displayed at the Exposition of necessity are mainly confined to equipment, the tools and means to accomplish results in chemical, industrial and laboratory methods and processes. From the practical point of view equipment is the key which releases the rusty locks of processing, without which the processes remain impractical of accomplishment.

In the past, as in the present, many processes have been delayed and their commercial realization postponed by reason of the inability to build equipment which makes them practicable.

For instance, the application of higher temperatures and pressures to oil cracking waited on the metallurgist's development of satisfactory alloys. Many difficult chemical reactions could not be carried out commercially until the manufacture of equipment lined with glass, porcelain, and so on, became a practical actuality.

300 Exhibitors

More than 300 exhibitors at this Exposition displayed every conceivable type and kind of equipment used in any chemical or industrial process. Twenty companies exhibited testing instruments for laboratory and field. Valves were shown by more than 30 manufacturers, from the ⅛-inch needle variety to the 48-inch gate valve for handling huge quantities of fluids under all sorts of conditions.

Fifty apparatus suppliers outdid each other in showing more accurate, durable, and speedy tools for every purpose. Solvent recovery equipment is made by 15 fabricators to handle everything from corrosive acids to water-oil emulsions. Thirty-odd pump makers matched wits and products for the education of the chemist, the engineer and the executive bent on collecting information on how to handle the movement of products and materials by this means.

For the oil man we find heat exchangers fitted with solid carbon tubes for handling the most corrosive materials without damage. Pumps were shown which were made of every conceivable material from glass and quartz to 18-8 alloy steel.

A new filter press removes solids from suspension and continuously removes the solid cake without scrapers or backblowing. This filter or any other may be fitted with heavy, closewoven cloth made entirely from glass fibers which withstands remarkably high pressures, considering the nature of the material, and at temperatures up to 500° F. The same glass is applied as thermal insulation to plant equipment, for temperatures up to 1100° F. Other filter media, from vegetable and mineral raw materials, offer other choices to meet hard problems.

"Speeding Up" Devices

In analytical work, one of the most outstanding developments is that of numerous devices for speeding up operations in using chemical balances. Magnetic dampers, which may be fitted to any type analytical balance reduce the "swing time" for zeroing weight balancing. A unique and somewhat fearsome arrangement of levers, hoists and hooks handles weights on and off balances with a speed unknown and unthinkable to the old-fashioned chemists who handled them slowly and laboriously by means of tweezers. All these points are in the interest of greater speed, accuracy and throughput, for the modern laboratory is as much concerned with throughput as is a cracking still operator.

The greater half of the show appealed especially to what may be called more strictly the chemical industry. Correspondingly, the chemical industry as such showed a relatively huge number of products derived or derivable from petroleum. Ketones, as methyl-ethyl, acids of the naphthenic types, salts such as sodium sulfonaphthenate, sulfohexahydrobenzoate; naphthenic soaps of varying acid and oil content, were shown along with alcohols, aldehydes and complex hydrocarbons for intermediates in chemical processes and syntheses. Phenols and phenolic resins, organic bases, solvents and numerous intermediate materials indicate very impressively the activity of the oil and chemical industries in utilizing petroleum and hydrocarbon gases as chemical raw materials.

For the chemical executive, the chemist and chemical engineer a catalog of the products, processes and equipment shown at the Exposition is to all intents a textbook or summary of the chemical industry's tools, and the Exposition itself is the latest development in the industry.

Standard Stockholders 'See' Company Operations in News Booklet

N. P. N. News Bureau

CHICAGO, Dec. 14.—To better dramatize for stockholders the activities of their company, Standard Oil Co. (Indiana) is enclosing with the quarterly dividend check a folder of six news pictures depicting launching of the S. S. Red Crown and transporting of a new evaporator tower.

The pictures are those carried recently by newspapers. The back of the four-page news booklet carries a letter of explanation from President Edward G. Seubert to the 94,000 stockholders. It reads:

To Stockholders:

On several occasions in recent months phases in Standard of Indiana's development of plant and equipment have attracted the attention of news camera men. Some of the pictures they have taken are shown herewith.

At Manitowoc, Wisconsin, the 465-foot SS Red Crown was launched September 18. Completed with speed, the new tanker began carrying petroleum products on the Great Lakes November 1.

At Jersey City, the cameras clicked on October 11 when a 210-ton evaporator tower was transferred from the M. W. Kellogg Company's plant to New York Bay. Too big to be carried by rail or barge, it was floated through the Hudson, the Erie Canal and the Great Lakes, 1371 miles, to the Whiting refinery, there to become part of a huge new cracking unit.

The two incidents illustrate activities by which our company is keeping ahead in manufacturing and transportation facilities.

Bonus Announced By 2 Companies

N. P. N. News Bureau

TULSA, Dec. 11.—Announcement of bonuses to employes was made this week by two companies, Continental Oil Co. and Plymouth Oil Co.

Continental is distributing nearly the equivalent of a month's salary, it was announced by President Dan Moran. He said the company's business this year has been the greatest in its history. "We are gratified to distribute this bonus in recognition of the contribution made by each employe," said Moran.

Announcement was also made of a 25-cent dividend on Dec. 20 to stockholders of record Nov. 29.

Plymouth Oil Co., Pittsburgh, owning nearly all the sizable Plymouth field, of the Corpus Christi district, Texas, and producer in the Big Lake field, Reagan county, Texas, through its subsidiary, Big Lake Oil Co., announced a bonus of two weeks' salary or wages to all who have been employed for more than a year. Those with less than a year's service will receive one week's pay.

Predict Big Drilling Campaign in Texas

AUSTIN, Texas, Dec. 13.—With Texas adding more than a half billion barrels in 1937 to its cumulative output of more than five billion barrels since its petroleum history began, the outlook for 1938 is that of a continuation of the big program of drilling of this year, thinks Col. Ernest O. Thompson, member of the Texas Railroad Commission.

Asserting there is no need for any new laws on oil, the colonel said the outstanding development of 1937 in oil regulation "has been the realization of oil producers that strict effective state control of production was to the benefit of the nation; that it gave the consumers cheap gasoline, and that it helped them (producers) by keeping them from overproducing themselves into bankruptcy."

SHREVEPORT, Dec. 13. — Clyde N. Robinson, Public Service Co., Tulsa, was elected president of the Petroleum Electric Power Club at its annual meeting here Dec. 10. O. W. Jones, Corpus Christi, was elected vice-president; Harry E. Roberts, Joplin, secretary-treasurer.

Vapor Pressure Method Revised Starting Jan. 1

N. P. N. News Bureau

TULSA, Dec. 13. — Beginning Jan. 1, a revised method for determining the Reid vapor pressure of natural gasolines is to become effective as the official standard of the Natural Gasoline Assn. of America.

Developed by this association in co-operation with the California Natural Gasoline Assn., the new method, which is officially known as D 323-37T, was adopted during the past year as a tentative standard for the industry by the American Society for Testing Materials.

The new method is intended for the determination of vapor pressures of volatile, non-viscous petroleum products and describes two different sampling procedures, one for products having vapor pressures of 26 pounds or less and the other for products of higher vapor pressures.

In case of doubt as to which procedure is to be used, the maximum vapor pressure specification of the product to be tested should be the determining factor without regard to the numerical value obtained by the test, the natural gasoline association points out. The association points out that the method is a combination of A. S. T. M. methods D 417-35T, "Vapor Pressure of Motor and Aviation Gasolines," and D 323-32T, "Vapor Pressure of Natural Gasoline".

As such it is said to supply a single standard for both the refiner and the natural gasoline manufacturer in Reid determinations, a fact which will be particularly advantageous in the volume transactions in products of 26 pounds vapor pressure or less, it is pointed out.

In making this combination of methods, A. S. T. M. method D 417-35T was carried over in practically the same form except for minor refinements in procedure and the inclusion of natural gasolines having vapor pressures up to and including 26 pounds. Old A. S. T. M. method D323-32T procedure was considerably revised in the interests of uniformity until it more nearly conformed with that of D 417. Then with the exclusion of air saturation and intermediate sampling, parts of it were used in those portions of the combined method covering determinations on products above 26 pounds vapor pressure. The result is a method which should yield more uniform and duplicable results on all products wherever they may be run, provided, of course, that reasonable care is taken in following the precautions and specifications of the method, it is said by natural gasoline manufacturers.

Long Testing Period

Before recommending the adoption of this method by the A. S. T. M. as a standard the N. G. A. A. Technical Committee conducted a long series of laboratory and field tests covering a period of nearly a year to compare the results obtained by the old and new methods. A total of 814 tank cars of natural gasoline were tested, many at both point of origin and at destination.

The results of these tests indicated that there was some economic hardship for the natural gasoline manufacturer in the adoption of the method, since it yields slightly higher results in the lower vapor ranges, the association stated. However, in view of the fact that it would provide the refiner with a more accurate and convenient method for his normal operations than did D 323, the N. G. A. A. did not feel that this handicap was justification for insisting on two methods of test covering the same field of testing.

Copies of A. S. T. M. method can be obtained from the offices of that organization, 260 S. Broad Street, Philadelphia, at the following rates; one to nine copies — 25 cents each; 10 to 24 copies — 20 cents each; 25 to 99 copies — 17½ cents each; and larger lots on quotation.

With 1937 Oil Demand at Peak Industry Raises Sights for '38

(*Continued from page 9*)

dime more per barrel. The 1937 price range was from $1.10 to $1.22, while in 1936 the range was $1 to $1.10.

Motor fuel produced in 1937 was about equal to demand, but the refineries drew heavily on stocks to meet the record 1937 demand for gas and fuel oils. Consumption of these products in 1937 totaled 498,000,000 barrels, while production was estimated at 422,000,000. This record consumption compared with a 1936 demand of 408,991,000 barrels, in itself a record year.

In 1937, for the third consecutive year, fuel oil consumed in home and industrial heating plants surpassed the quantity required for bunkering vessels, the largest use prior to 1935.

Heavy taxes on automotive fuels continued to be a burden on the oil industry, the American Petroleum Institute pointed out. In fact state and federal gasoline sales taxes were estimated at close to one billion dollars, an all-time high. This amount is nearly $125,000,000 greater than the automotive tax bill of 1936.

"This substantial increase results chiefly from the remarkable expansion of automobile ownership currently taking place among families with incomes of less than $20 a week," the A. P. I. commented.

The total number of motor vehicles increased by 2,000,000, sufficient to place motor vehicles on the highways approximately bumper to bumper, especially during rush hours. Nevertheless, unless the current recession turns out to be a depression after all, the automobile manufacturers expect to squeeze about 1,000,000 more cars on the roads.

"If gasoline taxes, which currently add one-third or more to the cost of motor fuel the country over, were reduced," the A. P. I. continued, "there would be a greatly accelerated expansion of ownership among the low income groups." This is not meant to indicate that gasoline taxes are a good thing as an aid to the traffic problem.

Nearly 60 per cent of all motor vehicle owners earn from $20 to $30 per week. They own vehicles (or jalopies) having an average value of less than $200. Mr. Average Automobile Owner paid $30 in 1937 on gasoline taxes alone, the institute pointed out.

1937 Operations of the Oil Industry at a Glance

	1936		1937	
Oil wells completed in the U. S.	18,523	wells	23,700	wells
Refineries operating	‡ 423		§ 425	
World production of crude oil	1,784,464,000	bbls.	2,015,000,000	bbls.
Domestic crude oil production	1,098,516,000	bbls.	1,280,000,000	bbls.
Crude run to stills	1,068,134,000	bbls.	† 1,180,000,000	bbls.
Crude oil storage, end of year	288,184,000	bbls.	315,000,000	bbls.
Crude oil price range	$1–$1.10		* $1.10–$1.22	
Motor fuel produced in U. S.	504,724,000	bbls.	† 555,000,000	bbls.
Motor fuel demand	509,422,000	bbls.	† 562,700,000	bbls.
Gas and fuel oil produced	411,338,000	bbls.	† 422,000,000	bbls.
Gas and fuel oil demand	408,991,000	bbls.	498,000,000	bbls.
Foreign trade in refined products				
Exports	79,377,000	bbls.	† 102,000,000	bbls.
Imports	24,491,000	bbls.	† 33,000,000	bbls.
Automotive taxes on pet. products	$1,425,000,000		$1,550,000,000	

* Up to Nov. 15.
† Estimate.
‡ Jan. 1, 1937.
§ Jan. 1, 1938.

Producers in Kansas Call Mass Meeting

WICHITA, Kans., Dec. 13.— Invitations to attend a mass meeting of independent oil operators, royalty owners and landowners have been sent out by E. B. Shawver, president of the Kansas Oil Producers and Landowners Assn.

The meeting, to be held in Wichita Dec. 17, will discuss means to obtain a larger market outlet for Kansas crude, said Shawver, a prominent independent producer. He asserted producers in Kansas are losing about one million dollars monthly because of encroachment of other states on its market.

The group will also organize to combat additional taxation on oil and is expected to make declaration for the retention of the 27½ per cent depletion allowance, now provided by federal law.

S. O. Indiana to Sell Quaker State Oils

N. P. N. News Bureau

CHICAGO, Dec. 13.—Effective Feb. 18, 1938, Standard Oil Co. (Indiana) will become exclusive wholesale distributors for Quaker State Oil Refining Corp.'s Quaker State brand of motor oils and Superfine lubricants.

Throughout the 14 midwestern states comprising Standard of Indiana's territory, Red Crown dealers will now display the Quaker State sign, in addition to dealers who now sell Quaker State products at retail in this area.

"The extensive facilities of the Standard Oil Co. (Indiana) will assure ideal service to the 35,000 dealers who now display the Quaker State sign throughout the (Indiana) territory as well as to many thousands of Red Crown dealers," a statement of the Quaker State company announced.

Particularly pleasing to the Pennsylvania refining industry was a statement by Standard Oil officials that "the move was made in recognition of a definite preference on the part of many consumers for a Pennsylvania motor oil."

Governor Lauds Pay As You Ride Highway Program

By E. L. BARRINGER
N.P.N. Staff Writer

OMAHA, Dec. 13.—Praise for Nebraska's "pay as you ride" highway building policy from the governor, and practical selling ideas from oil men were highlights of Nebraska Petroleum Marketers, Inc., 17th annual convention here last week.

Nebraska marketers, besides listening to eight program addresses, elected new officers, adopted four resolutions, entertained their ladies at a luncheon and enjoyed the usual annual banquet and ball.

The "pay as you ride" highway building policy, Gov. R. L. Cochran, former state engineer, told oil men, resulted in all income being spent on the highways, none going to pay interest on bonds, and in the state taking advantage of technological advances in road construction.

8500 Miles of Roads

Nebraska by constitutional provision cannot bond itself, and all highways have been built and maintained out of current income. Now the state has about 2500 miles of permanently paved roads and about 6000 miles of gravel highways, the governor said.

History shows, the governor continued, that bonds are issued in periods of prosperity at high interest rates and paid off during depression years. Yet Nebraska has not issued road bonds and has no interest to pay.

Defends Tax Rate

The hotel lobby and hall outside the meeting room contained exhibits by the state petroleum industries committee on taxation, and the governor defended Nebraska's 5-cent rate, 1-cent of which is diverted to old age relief.

Governor Cochran pointed to Nebraska being 20th among the states in car registration but 39th in the amount of automotive tax collected. The governor also pointed to Nebraska not collecting taxes on cigarets, general sales, incomes, as do adjoining states.

The convention opened Dec. 7 with the city's welcome from Commissioner Harry Kundsen, a former oil man. Cullen T. Wright, of Omaha, billed as the "Will Rogers of Nebraska" advised oil men to be alert to changes as there is "nothing more pitiful than a man doing business in the same manner as his grandfather," also that the "man who won't change is dead and don't know it."

Kinderman on Sales

Wright also cautioned oil men to beware the public picking on the oil industry, as it has on railroads and utilities and urged telling the public the oil industry's troubles "When the public knows its judgment will be correct," said this speaker.

Walter Kinderman, Phillips Petroleum Co. merchandising manager, pointed out that service station gallonage averages had dropped in the last 10 years, with stations built faster than volume increased, and that stations to exist must take advantage of sales opportunities.

Stations have "store traffic," Kinderman pointed out. On an average a motorist is in a station 130 times a year and 85 per cent of the motorists buy from one station for three months or longer, he stated.

Marketers were urged to diversify their line of merchandise, "to sell every item needed on the automobile," and that such items, even if small, constitute big business for the station. Kinderman spoke against "barber shop selling," and in favor of the salesman observing a customer's needs then make intelligent suggestions.

Service on Down Grade

Service at stations is decidedly on the down grade, Kinderman said. The speaker urged better housekeeping in the appearance of the station and the salesmen, plus better selling through personal service and better approaches.

The second speaking program, Dec. 8, opened with a review of automobile engine efficiency by C. M. Berry, Ethyl Gasoline Corp. engineer. Berry reviewed the rise in compression ratios in motor cars and predicted still higher compressions for 1939 models.

A full spark, right up to the point where the fuel would just ping, was advised. Berry pointed to a survey showing that 86 per cent of gasoline complaints, found through working with automobile factory men, came from a retarded spark.

Asks Broad Viewpoint

A plea for a broad outlook of the industry's problems, rather than from the aspect of a single station, was made by Carl Barker, Shell Petroleum Corp., St. Louis, chairman of the Missouri Petroleum Industries Committee.

Barker had pointed out that regulation has its effects beyond a single group, and spreads beyond a single community. Also, that it is necessary to build a sound understanding of the industry with the public, to prohibit spreading of false information, and that as the industry becomes larger it becomes more vulnerable in coming into competition with other industries.

A Farm Yard Scene

The program closed with a two-act drama on how not to and how to sell grease to a Nebraska farmer. Ralph Mathews, Battenfeld Oil & Grease Co., Kansas City, was the salesman. Arthur Evans, also with Battenfeld, was the farmer.

The first act was on how not to make a sale. Salesman Mathews smoked, offered a smoke and a drink to the farmer who refused, then blew smoke in the farmer's face. Then the alleged sale continued by the salesman disparaging the farmer's buildings, tractor, and finally the products of a rival oil company.

The second act was how to make the sale. Salesman Mathews complimented the farmer on his buildings and tractor. Then he demonstrated the quality of his products, neatly got around a price situation of a competitor's lower price, got the order and made an extra sale.

After the formal program Don M. McBride, of Omaha, Phillips Petroleum Co., and chairman of the Nebraska Petroleum Industries Committee, read the committee's platform, the names of the state committee, and introduced H. H. Hahn, of Lincoln, the committee secretary.

Trenchard Heads Nebraska Assn.

OMAHA, Nebr., Dec. 13.—A new set of officers for the Nebraska Petroleum Marketers, Inc., was elected at the annual convention here last week, with J. W. Trenchard, of Cambridge, Trenchard Service Station, as president.

For three terms O. D. Corey, of Lincoln, Corey Fuel & Oil Co., had been president until he withdrew from the oil business several months ago. Thomas H. Murphy, of Greeley, Murphy Oil Co., as first vice-president, was acting president until the convention.

Other officers elected last week are Paul Engler, of Bassett, Rock County Oil Co., first vice-president, and F. K. Richardson, of McCook, Richardson Oil Co., second vice-president. Engler had been a director.

Two new directors elected for three years are S. E. Torgenson, of Kimball, Farmers Motor Fuels, Inc., and Tom Lambert, of Columbus, Randall Oil Co.

Joe Gangel, of Nebraska City, Gangel Oil Co., was elected director for a one year term.

President Trenchard announced the association is considering a secretary and field representative, and that a number of new members had been obtained during the past month.

Four resolutions were adopted at the annual meeting as follows:

A reduction of one cent in Nebraska's 5 cent tax was urged. The rate, higher than in adjoining states, had decreased gasoline imports and encouraged "evasion, misbranding, blending, substitution, etc., to the great detriment of honest petroleum dealers," this resolution stated.

Immediate repeal of the federal lubricating oil tax and the federal gasoline tax was urged in two other resolutions.

State gasoline tax diversion (1-cent of Nebraska's tax goes for old age relief) was opposed in the fourth resolution.

New Truck Rate System For Nebr.

LINCOLN, Nebr., Dec. 13. — An airline freight rate structure for non-competitive points has been established for Nebraska effective in February.

Nebraska has two competitive points on petroleum products, explains C. M. Sutherland, of Lincoln, of United Petroleum Transports Assn. These are Superior, long a rail head and terminus of the Champlin Rfg. Co.'s gasoline pipeline where shipments leave by rail and transport, and Omaha where a rate was set up years ago for a refinery and present terminus of the Great Lakes Pipe Line Co.'s gasoline pipeline that ships into the state by rail.

Petroleum shipments originating at any point in the state except Superior and Omaha would come under the new non-competitive point rate structure.

To determine the rate the airline distance between the two points would be determined and the petroleum rate computed from the first class rate. The first class rate of 34 cents takes a petroleum rate of .59-cent a gallon, a $1 first class rate takes a 1.84-cents oil rate.

The airline rate would apply where a jobber brings gasoline into the state in interstate commerce to some point other than Superior or Omaha, then reships the transport to some other point in the state.

Virginia Jobbers Will Seek A State Price Posting Law

By G. T. KELLOGG
N.P.N. Staff Writer

RICHMOND, Va., Dec. 13. — A "price posting law" similar to that passed by Pennsylvania's legislature last winter and to that now in effect in Michigan will be sought by the Virginia Petroleum Jobbers Assn. during the session of the Virginia Assembly which opens next month.

Decision to work for such a law was reached at a meeting of the jobbers' association here last week, when President Ira F. Walton appointed a legislative committee of three to draw up the proposed legislation.

The committee working on the proposal, which probably will be introduced in both houses of the assembly as an amendment to the existing liquid fuels misbranding act passed several years ago, is headed by William Earl White, Delta Oil Co., Petersburg, Va., vice-president of National Oil Marketers Assn. Working with him are T. C. Watkins, jr., U. S. Oil Co., South Boston, Va., and M. B. Whiting, Whiting Oil Co., Clifton Forge, Va., past-president of the N. O. M. A.

Besides the resolution on the price posting law, the jobbers reiterated the stand they took at a meeting during the summer against the undistributed profits tax, and went on record as endorsing the proposals now before Congress for its repeal.

Endorse "Divorce" Bills

They followed the lead of the N. O. M. A. in endorsing the Biermann bill to divorce major oil companies from their marketing operations, as well as the Borah bill for divorcement of the pipelines from the other branches of the industry.

Another state matter for which the oil jobbers of Virginia will work is a "merit system" basis for payment of unemployment compensation taxes. Already, they pointed out in their resolution, a number of states have placed payments to the unemployment compensation fund on a merit basis, and provision for such a basis is contained in Virginia law.

However, the Virginia law says the state unemployment compensation commission shall make an investigation into the desirability of the merit system "not later than" 1939. The jobbers will work toward adoption of the system immediately, so that employers who "earn" a lower rate of tax by keeping employment in their establishments stable, that is, not adding to the number of unemployed, may have the benefit of the lower rate sooner.

Year-to-Year Basis

Under the proposal discussed at the meeting, the system would be worked on a year-to-year basis. That is, if an employer kept employment in his establishment steady during 1938, his tax rate would be correspondingly lower during 1939, but if he added to the number of unemployed by dismissals in 1939, his tax rate would slide up again in 1940.

It is probable another meeting of the Virginia jobbers may be held during the state legislative session. President Walton, of the Roanoke Oil Co., Roanoke, Va., said he felt a "short" program such as that represented by the five resolutions, would admit of more intensive effort and had a higher probability of accomplishment than if "we asked for everything" and weren't able to press for action on specific proposals.

Plant Starts Up

SHREVEPORT, La., Dec. 13. — The Arkansas-Louisiana Gas Co's new gasoline absorption plant near Jefferson, Texas, in the Marion county part of the Rodessa field, has begun operating. It will handle 25,000,000 cubic feet of gas daily when running full capacity, which will be about Jan. 1.

City Grading Of Motor Fuel Is Dropped In Richmond Bill

RICHMOND, Va., Dec. 13. — Richmond's city council has passed the new weights and measures ordinance proposed some months ago by Weights and Measures Inspector B. W. Ragland, but without the octane grading sections it originally contained.

The provision for municipal grading was dropped from the ordinance on the advice of the city attorney, who said such a provision was inconsistent with Virginia laws, which accept federal Bureau of Standards specifications, and prescribe that no city or town may make laws controlling motor gasoline inconsistent with the state statute.

Upon receipt of this opinion, Ragland stated "we shall not make any effort to grade motor gasoline."

Through conferences between members of the oil industry in Richmond and Ragland, sponsor of the proposal, several other points in the ordinance which the industry said would work a hardship upon it were ironed out before passage.

In order to avoid delay, a clause was written into the inspection section of the ordinance providing that the inspection of bulk gasoline must be made within 24 hours after notice of its receipt in the city has been received by the inspector's office. Gasoline must conform to the state specifications, and when it has been inspected and found to conform, it is to be labeled "Richmond Tested Motor Fuel."

A "grandfather clause" was originally written into the section of the ordinance which would have required that every fuel oil truck be equipped with a meter, as well as a provision that trucks used for deliveries in quantities of less than 100 gallons need not have meters.

The ordinance as passed provides that trucks now in service need not have meters installed until June 30, 1939, although all new equipment must have a meter for each "tank or compartment". An emergency clause allows delivery of fuel oil in non-metered trucks — in case of a sudden cold snap or other cause for a sudden rush of orders — under a special permit of the inspector.

Another new section provides for destruction of lubricating oil cans when emptied.

The new ordinance is to become effective Feb. 1, 1938.

A story in the Oct. 27 issue of NATIONAL PETROLEUM NEWS telling of the proposed ordinance, which then contained the city grading provision, said that Inspector Ragland protested deferring action on the law. This was a misstatement. At that meeting of the city council's ordinance committee, Ragland asked that a sub-committee be appointed to study the proposal. A subcommittee was appointed, and the law as subsequently enacted was substantially agreed upon at that time.

Trucker Called Common Carrier

N. P. N. News Bureau

WASHINGTON, Dec. 13.—The Interstate Commerce Commission has ruled that the operations of Petroleum Transit Corp., Detroit, are those of a common carrier, and has granted its application for a certificate of public convenience and necessity.

The corporation filed applications last year for common carrier certificate and a contract carrier permit, asking the ICC to determine which category its operations fell in. The company's operations are in Indiana, Ohio and Michigan.

Petroleum Transit, according to testimony before ICC, operates a fleet of 24 tractors and 23 trailer tanks, the capacity of which varies from 4200 to 4604 gallons. Testimony also brought out that a number of oil companies operating in the territory served by Petroleum Transit would use its services, whether it was adjudged a contract or common carrier.

A number of oil companies told the commission that unless the application of Petroleum Transit, or some other qualified operator were granted, they would be forced to transport their products in their own equipment, but that they preferred to employ the applicant company.

Protesting railroads contend that adequate service by rail was available, but the ICC ruled that "communities are entitled to adequate service by motor vehicles as well as by railroad," as it has previously ruled on this point.

American Can Official Dies In Chicago

NEW YORK, Dec. 13.—William E. Taylor, vice-president and director of the American Can Co. here, died suddenly Dec. 9 at St. Luke's Hospital, Chicago, after a district sales meeting at the Chicago Athletic Club. He was 59 years old.

Taylor rose from a mechanic in 1901 at the Baltimore factory to become vice-president in charge of manufacture in 1932. He brought about much of the improvement in the can manufacturing business and in the canning industry during this time.

Surviving are his wife, Emma C. Taylor and two sons, Russel C. and William E., Jr.

Cracking Infringement Suits To Continue, Authorities Say

N. P. N. News Bureau
By ARCH L. FOSTER
Technical Editor

CHICAGO, Dec. 13.—Hearings on the suit of Universal Oil Products Co. against the Globe Oil & Refining Co., of Illinois, on a plea of res judicata, were held here recently before a master in federal court. Testimony of 10 witnesses was taken but no decision was reached.

If the master finds that Globe had no privity in the court action of Root Refining Co. in 1933, when Delaware courts upheld Universal's suit for infringement against Root, the case will then be tried on its merits here, with the master taking full testimony regarding cracking patents involved.

The plea on which hearings were held here, before a master involved the charge that the question of infringement of two patents held by Universal—Dubbs patent No. 1,392,629 and Egloff patent No. 1,573,593—was settled in the Delaware courts when Universal's suit against Root was upheld. The Root action is now pending for accounting before a special master in chancery.

Universal's Contention

Universal's plea of res judicata contends that, since Globe as well as other Winkler-Koch licensees participated in the Root defense by defraying part of the litigation expense, they became a party to the case and were bound by the court's final conclusions in that case.

Globe maintains it was not a party to the Root-Universal action.

While the recent treaty between Universal Oil Products Co., and the Texas Co., Gasoline Products Co. and allied oil companies provides for licensing a large number of companies under the Behimer patents, and removes from possibility a great number of possible infringement suits back and forth, that treaty agreement does not affect the position of non-licensed refiners who may be accused of infringement of cracking patents owned and controlled by any of the major licensing organizations.

A hasty review of the present cracking position of U. S. refineries indicates that some 22 refining companies are not licensed by the patent-owning and licensing companies, at least ten of which are under suit by one or more of these licensing companies, for alleged infringement of various patents.

These non-licensed companies represent approximately 90,000 barrels per day of cracking still charging capacity. All are in the small refiner class, with the exception of one company, for which the latest published figures give 20,000 barrels per day capacity of the cracking plant.

The closing chapter of the Universal-Root refining suit, which was carried to the U. S. Supreme Court, and decided in favor of Universal, is being written now, with an accounting before a master, to determine the amount of damages, as before mentioned. This last move of the plaintiff in the Globe suit may have a far-reaching effect on other suits against operators of so-called Winkler-Koch units.

Settlement Basis

If Globe be decided to have had privity in the Root case, then Globe's case may be settled on the basis of the Root decision. Failing that, Globe may be tried on the facts of operation of its individual units, as to whether or not these operations infringe the Dubbs and Egloff patents.

Counsel for Globe Oil & Refining in the hearing in federal court in Chicago was the law firm of Ames, Thiess, Olson and Mecklenburger. Judah, Reichmann, Trumbull, Cox and Stern represented Universal Oil Products Co.

N. P. N. Told It First

NATIONAL PETROLEUM NEWS to date has been the only oil journal to tell the significance of the licensing agreement signed Dec. 1 by the Universal Oil Products Co. and The Texas Co., Gasoline Products Co. and other refiners. This was in an article in its Dec. 8th issue by Arch L. Foster, Technical Editor.

News made history in this important contribution to the future development of cracking and NATIONAL PETROLEUM NEWS told it first.

Treasury Hints Collusion After Identical Bids

By Teletype
N. P. N. News Bureau

WASHINGTON, Dec. 14. — Identical bids received from oil companies to supply gasoline for federal activities in Region 6 (West Coast states, Arizona and Nevada) during the first quarter of 1938 have led the Treasury Procurement Division officials to send out invitations for new bids and at the same time throw out the old bids, opened here Nov. 16, it was learned today.

It is also understood that the identical bids have been turned over to the Treasury department's general counsel for investigation.

At the Treasury department it was said that identical bids hereafter will, in most instances, be treated as prima facie evidence of collusion, and turned over to the department's counsel, who may in turn pass them along to the Department of Justice for investigation into possibility of prosecution under the anti-trust laws.

The new invitation form which Region 6 bidders are asked to fill out, returnable Dec. 20, is identical with that sent earlier, with the exception that the new form has printed in capital letters on its first page:

"The undersigned represents that prices in this bid are neither directly nor indirectly the result of any agreement with any other bidder."

This statement will be printed on all bid forms sent out in the future, the division said. It was not printed on the forms sent out in the fall for bids on the January-March quarter.

At the TPD it was indicated that the bids on gasoline for delivery at all government stations in Region 6, showed the same trend as those of the city bids, a typical set of which is that for San Francisco.

Sample of Bids

For supplying government activities in San Francisco, according to the bid tabulation, eight different companies offered identical bids on the 148,555 gallon estimate — commercial consumer tank wagon less 3 cents, with a maximum of 10.5 cents. They were Signal Oil Co., Los Angeles; The Texas Co.; Standard of California; General Petroleum Co. of Calif.; Richfield Oil Corp.; Tide Water Associated; Union Oil Co. of Calif.; and Rio Grande Oil Corp., Los Angeles.

The only other San Francisco bidder was Gilmore Oil Co., Los Angeles, whose bid was on a basis of tank wagon flat with a maximum of 10.5 cents.

Similar identity of bids was shown in the other cities of the region, a tabulation showed.

Jobbers Protest Kans. Gasoline Tax Regulations

By Teletype

TOPEKA, Kans., Dec. 14.—Dissatisfaction that has been growing among motor fuel distributors in Kansas the past four months over the state's regulations with reference to enforcement of the gasoline tax came to a head here today.

More than 500 oil men attended a mass meeting called by Governor Walter Huxman, in an effort to iron out the difficulties.

At the all-day meeting, where those attending overflowed the House of Representatives' hall, the governor listened to briefs outlining grievances, presented by spokesmen for major and independent refiners, retailers, distributors and co-operative associations.

Governor Huxman told the motor fuel distributors at the meeting that hereafter the state inspection department will not disallow the claim for tax exemption on motor fuel merely because the permit holder has failed to send in his copy of the delivery slip. The virtual elimination of the so-called "pink slip" accordingly removes one of the major complaints of the Kansas oil men.

He also listened to a number of individuals who desired to cite specific instances of hardships imposed on them.

Relief Promised

The governor assured the oil men as a result of the meeting he and his commissioner in that department, Louis Grimes, would go into a huddle in an effort to lessen the burden. The governor declared he realized the law as written was unreasonable but added it was the duty of the state to enforce that law as long as it was on statute books.

Governor Huxman also suggested the various organizations represented at the meeting, as well as any others that might care to do so, appoint representatives on a general committee, which will meet once a month at Topeka to discuss with him any problems that might arise, and to counsel with state officials in matters pertaining to the tax law and its regulations.

A majority of the briefs presented dealt with regulations making distributors liable for the tax when a tax exempt permit holder failed to send in his exemption invoice; with regulations pertaining to transport truck operations.

Mid-Continent SKYLINE

By LAWRENCE E. SMITH, N. P. N. Tulsa News Bureau

TULSA, Dec. 11

In Oklahoma and Texas two of the elder statesmen have come out of the jimpson weeds and, as usual, they are inducing chills, attended by a degree or so of fever, in others who aspire to the governorship.

"Jim" Ferguson returned to the wars last week when he revived his Ferguson Forum, highly personal weekly journal. He was preceded in this sortie by "Alfalfa Bill" Murray, now in residence on Yashua Creek, southeastern Oklahoma. Under the management of the redoubtable Colonel "Cousin" Cicero I. Murray, the Blue Valley Farmer was put into circulation to carry the thoughts and programs of Ex-Governor Bill.

Murray is an announced candidate for governor of Oklahoma. Ferguson can't run, for the disability which attended his removal from the office of governor of Texas years ago has never been removed. He has twice put Mrs. Ferguson into the office and there is some suspicion that he may send her forth again to represent his ideas.

In his Forum Ferguson endorses the Townsend plan, urges payment of a $200 monthly pension to all persons over 65 who are qualified under the state constitution to receive them. He would levy a two per cent sales tax to raise the money.

* * *

Is Oil Lease Realty?

In its prowling about for more things to tax, the U. S. Treasury Department has turned its attention to oil and gas leases and in a recent ruling it declares:

"Oil and gas leases covering lands in Kansas and Texas, which are of unlimited duration or for a term of years and as long thereafter as oil and/or gas is produced from the property, are subject to stamp tax as conveyances of realty."

This is not a question in Texas, as state law and decisions of the courts support such construction. But in Kansas it is different. The ruling quoted also declares: "What constitutes real property (is) determinable by law of state where located." Kansas court decisions are that oil and gas leases are not real property. Hence the treasury declaration conflicts with the state rulings.

There is further confusion in the body of the ruling for, in the attempt to base the ruling on state law, citation of a decision of the Kansas Supreme Court is given. That decision, however, had to do with royalty, not leases. There are decisions of the same court holding that transactions in leases do not constitute conveyances of realty. The treasury people have read into their citation something the court did not say.

* * *

The Sunday Shutdown

The Texas Railroad Commission is to consider testimony on which to base its January proration order at the monthly statewide hearing Dec. 17. The question of continuing the Sunday shutdown in East Texas doubtless will be brought up. There has been no formal, organized opposition as yet — most of the vocalizing on the subject has been done by Commissioner Lon A. Smith, who has usually opposed any reduction in the East Texas allowable.

The fourth Sunday shutdown was the 24-hour period ended at 7 a.m. Dec. 13. The avowed purpose of the closings was to take bottom hole pressure tests, but the incidental effect has been to cut off approximately two million barrels of East Texas production in the four weeks.

* * *

Wichita Falls Revival

Down on the Wichita-Archer county line in Texas, there are fireworks in the making. In this old area, where the Kemp-Munger-Allen field was a development concurrent with the overshadowing Burkburnett and Northwest Extension excitement of 1919-20, recent extensions of the deeper (3700-3800-foot) horizon found several years ago have brought the boys back to north Texas. Something of a boom is in prospect. Last week saw a mile extension of producing territory with a well that made as high as 200 barrels per hour. Independents largely control the area.

The oil found there is more than 40° A. P. I. gravity and the depth, which is shallow, for these times, has brought the area into greater prominence than anything that has happened in those parts for many years. Some enthusiasts are talking about 40 miles of continuous production; that remains to be seen. It could be that, but it also could be several smaller pools of the pattern that characterizes the area in the shallower pools which have been producing for years. Some wells in the new deep play are reported to have had as much as 40 feet of the sandy lime pay.

Anyway, things are brightening up in the area and operators are dropping other business to go in and have a look. Several sizeable buys have been made, running into real money. At the last account 38 wells were drilling and the completed wells in the deep pay had a potential of about 25,000 barrels daily, with an allowable of 3000 barrels.

* * *

Intangibles Tax

All pending litigation affecting the intangible assets tax law in Texas has been dismissed as the result of final judgments in test cases in the U. S. Supreme Court and the state will now proceed to collect the tax. State tax officials figured to get in about $3,000,000, which will be shared with 180 counties having some or considerable pipeline business therein. The only remaining question is whether the pipelines will have to pay penalties and interest on the taxes, which were not paid in while the question was in the courts, from 1924-36 inclusive.

This tax is arrived at by capitalizing earnings of pipelines and is additional to ad valorem levies.

* * *

Price Conference, Episode 3

The governor of Arkansas has revealed that the governor of Oklahoma queried him concerning the accommodations at Hot Springs for the proposed conference of governors on oil prices and conservation. A half dozen governors have replied to Gov. Marland's telegraphed suggestion of three weeks ago that they would attend or send representatives. The governor of Texas replied bluntly that price-fixing was something he didn't want to fool with.

Last week Marland appointed Alex W. McCoy, distinguished geologist and petroleum engineer, to prepare an estimate of the nation's oil reserves for presentation at the conference, if held. McCoy was a member of the geological staff of the old Marland Oil Co. and is a former president of the American Association of Petroleum Geologists.

Swope, Magnolia Executive, Dies

By Teletype
N. P. N. News Bureau

TULSA, Dec. 14. — Ernest E. Swope, vice president and general manager of refineries of Magnolia Petroleum Co., died Dec. 12 of a heart attack. He was 52 years old.

Mr. Swope joined the Magnolia organization in 1917 and a few months later became chief refinery engineer. In 1928 he was made assistant general manager of refineries and succeeded the late E. E. Plumly as manager early in 1936. His long residence in Beaumont and his activity in civic affairs had made him one of that city's foremost citizens.

Surviving him are his widow and three sons.

Tide Water Executive Dies In New York

NEW YORK, Dec. 13.—Robert McKelvy, an executive of Tide Water-Associated Oil Co., died here Dec. 9, aged 62. He had been ill for several months. He was a son of David McKelvy, one of the three original founders of the Tide Water Oil Co. in 1878.

Robert McKelvy entered the oil business soon after graduation from Princeton in 1898. In 1908 he joined Tide Water at its Titusville office, and, in 1918, after the death of his father, he became an executive in the New York office. He was made a director and vice-president and continued in these positions until his death.

He is survived by his wife, Florence Orth McKelvy and one daughter, Mrs. Julius Bird.

Made General Supt.

NEW YORK, Dec. 13.—Albert Wright, for 11 years with the Venezuela subsidiary of the Gulf Oil Corp., has been appointed general superintendent of the Amiranian Oil Co., Seaboard Oil Co. of Delaware affiliate owning a large concession in Iran (formerly Persia). The company's and Wright's headquarters are at 39 Broadway.

Ickes' Letter Again Disputed in Court

(*Continued from page* 13)

and two years later going with Mid-Continent when that company bought out Hawkeye. During the NIRA period, McDowell devoted between 40 and 50 per cent of his time to code work.

Overruling objections to McDowell's testimony that independent refiners were hard-pressed early in 1935, Judge Stone declared that a defendant was in a different position than an ordinary witness.

A few minutes later the court permitted the jury to be shown a chart of the organization for administering the oil code, starting with President Roosevelt at the top and including the P. and C. Committee set-up, which he had barred earlier in the trial.

McDowell next testified as to a meeting of the "tank car stabilization committee" at Chicago early in January, 1935, to which he was invited by C. E. Arnott who, he said, was "known among us as Chief Stabilizer as a result of Secretary Ickes' letter."

Ickes' Letter

He was referring to Ickes' letter of July 20, 1934, to Chairman Arnott of the P. and C. marketing subcommittee, purporting to authorize him to engage in stabilization activities.

McDowell listed 39 individuals, including 16 of the defendants, he recalled as being at the Chicago meeting. After Arnott opened the meeting with the statement that the improvement in the retail price structure would go for naught if the competitive factor of cheap or "hot" gasoline were not taken care of, B. L. Majewski, Deep Rock, and I. A. O'Shaughnessy, Globe, insisted that something had to be done for the small refiner, the witness said.

A committee, with McDowell as chairman, was appointed by Arnott, to be known as the tank car stabilization committee, to make a study of the mid-western tank car market and report back to him, McDowell testified.

McDowell said that he first read of the Ickes-Arnott letter in the trade press and then was shown the letter, and an accompanying legal opinion on it by Louis Titus, general counsel for the P. and C. Committee, by P. M. Miskell, of Empire, who was then regional marketing chairman under the code.

Asked by Donovan if he believed that the Ickes' letter authorized Arnott to do what was decided upon at the Chicago meeting, McDowell replied yes.

Ickes' Letter Attacked

Government counsel asked that the jury be excused and then they began their battle to block admission of the Ickes-Arnott letter and the Titus opinion.

They argued that the defendants could not have "reasonably" believed that the letter authorized them to deal with tank car prices, contending that it was limited to stabilization of retail prices.

"If Mr. Ickes sent me a letter of this kind," remarked Judge Stone, "I think I would be inclined to act upon it."

Government Attorney Chaffetz said they were not questioning anything that was done by authority of the letter, but insisted that defendants should have gone back and asked Ickes for authority to stabilize tank car prices.

Donovan read to the court Titus' opinion dated in July, 1934, which concluded that the Ickes' letter was "complete protection" to Arnott and his committee to "engage in all reasonable activities to restore prices to normal levels."

"I further conclude," Titus' opinion ended, "that, the agent (Ickes) of the President having solicited the taking of action to stabilize prices, that it is unthinkable that there should ever be a prosecution or criticism by the government for doing the very thing the President's agent had asked you to do."

'Retail Prices Only'

Chaffetz contended that even the Titus memorandum assumed that the Ickes' letter dealt only with retail prices.

"Your Honor cannot believe," the government attorney said, "that this defendant really believed that he was acting under this letter, in view of all the circumstances."

"Don't you think he ought to have the letter go before the jury, in order to have the jury pass upon it?" the judge asked Chaffetz.

Chaffetz argued that if the defendant-witness were allowed in this way to show his "good faith" and belief that he was acting with authority, then the government would be forced to "prove its other indictment" in this case, showing that "other things" allegedly done by some of the defendants at so-called stabilization meetings which were not authorized by Ickes' letter and that "meetings" were held prior as far back as 1931.

Judge Stone said it was not important how long it may take to "prove all those other things." If it means staying here another month or two, "we are going to do it, because justice must prevail," the judge added.

Just before the noon recess, the judge said he wanted to carefully read over the letter again. He was also given some documents by government counsel.

Bars Ickes' Letter

With the jury back in the box, Judge Stone started the afternoon session Dec. 13 by asking McDowell to tell about price wars and what was done to eliminate them in 1934.

McDowell said the price wars reached their peak in October-November, and, that through a series of stabilization meetings, conditions were greatly improved in December, 1934.

The argument over the Ickes-Arnott letter was renewed as Donovan offered it in evidence.

Judge Stone interposed to remark that the letter gave authority to deal with price wars in certain localities, adding that these were "pretty well cleaned up by December, 1934."

Donovan insisted that the letter authorized steps to prevent a recurrence of price wars; he contended that it was implicit in the letter that Arnott had authority to deal with the situation.

Government counsel reiterated that the letter showed on its face that it applied to retail-price stabilization only.

After much more argument, Judge Stone ruled that the letter was "unambiguous" and was limited to retail prices, barring it from evidence along with the Titus memorandum.

Offers Letter Again

Donovan renewed his proffer of these documents twice more during the afternoon as the witness gave additional testimony that price wars did not end in December, 1934, but recurred in 1935 and told about small refiners being affected by the "flood of 'hot' oil" after the supreme court invalidated Section 9-C of NIRA. But the ruling was the same.

McDowell next testified as to a meeting of the tank car stabilization committee which he said was held Feb. 5, 1935, in the office of Mr. Bullock in the Standard Oil building in Chicago, where there was a general discussion of the tank car market situation, he said.

He said that at the meeting Mr. Borque, secretary of the Western Petroleum Refiners Assn., read a list of 16 or 17 independent refiners in the Mid-Continent who would have from 600 to 700 cars of "distress" gasoline during February.

Mr. Ashton (Lubrite) made quite a point of the fact that there were 10 or 12 major companies in that same area who regularly bought gasoline, McDowell said.

Some one immediately suggested, "why not get the major companies to buy this distress gasoline," he added.

Opposed Buying Program

Opposition to the suggestion was voiced, McDowell said, by Bullock (Standard of Indiana) and Karstedt, who contended that it was like "mopping up the ocean" with "hot" gasoline moving out of East Texas. These two also pointed out that they had had some experience with buying programs in 1934 and that they wanted nothing more to do with anything having to do with allocations or commitments, or anybody telling them how much to pay for gasoline, he added.

As an alternative, Bullock and Karstedt favored a cut in the price of crude, the witness added.

The day's sessions concluded shortly after Donovan read to the jury correspondence (dated around Feb. 1, 1935) between O'Shaughnessy and Charles Fahy, chairman of the PAB, in which the Globe president stated that stabilization of retail prices could not be continued without raising tank car prices to a parity with crude, and calling attention to Arnott's appointment of a committee "for this purpose."

Fahy's reply said "the tank car situation in relation to the price of crude is one about which we have no disagreement. How to bring about a correction is the stumbling block." He pointed out that a special committee (the Blazer committee) had been appointed to study the situation and a report was expected soon.

Government counsel objected, but were overruled on admission of this correspondence, which McDowell testified was read at the Chicago meeting.

Opening the morning session Dec. 14, Samuel F. McCluney, Tulsa, of Sunray Oil Co., and George J. Petersmith, El Dorado, Kans., of El Dorado Refining Co., testified as to gasoline production and sales of their respective companies. By stipu-

Sought 'Dancing Partners' for Refiners

lation, similar data was put in for Rock Island Refining Co.

Resuming his testimony about the Feb. 5, 1935, meeting of the Tank Car Stabilizing Committee, McDowell, said that Ashton, summing up his suggested "plan," declared that there was to be no pool or central buying agency, that each company would buy in accordance with its needs and make its own deal with the selling refiners; that there were to be no commitments or allocations as in the 1934 buying program, and that the committee would urge the buyers to consider paying the fair, going market price in their individual transactions.

Another meeting was held Feb. 11, 1935, at which the term "dancing partner" was first used, McDowell added.

With a list of independent refiners and amounts of distress gasoline, Ashton went around the table, asking each company representative present if there were any particular refiners in the list that they were buying from or would like to buy from, he said.

Preference Expressed

A number of companies expressed preferences, because they sold crude or natural gasoline to a certain refiner or had a lubricating oil contract with him. But at the end there were still seven or eight independent refiners who had no prospective customers, the witness brought out.

"Here we are at a great economic ball," McDowell quoted Ashton as saying, "The major companies who are buying gasoline now have picked out certain strong, independent refiners. Those that haven't been spoken for remind me of wallflowers at a country dance. I think it is going to be one of the jobs of this committee to find dancing partners for these refiners."

At the Feb. 11 meeting Ashton proposed that a "mechanical sub-committee" be appointed to collect data on the availability of distress gasoline and serve as a clearing-house of information, McDowell said.

On this subcommittee were appointed Ashton, Miskell (who suggested O. J. Tuttle, also of Empire, to serve in his stead) and McDowell. Later W. Paul Jacobi, Socony-Vacuum tank car buyer, replaced Ashton, so that then all three members were Tulsa residents, he added.

McDowell said the "plan" was discussed with Arnott over the telephone Feb. 11 and that, on Feb. 26, 1935, it was taken up with Arnott personally by McDowell and Ashton, with Bourque present for part of the time.

Approved By Arnott

Arnott, according to McDowell, definitely approved the plan at that time, but told them it was advisable to wait until steps were taken to enforce the newly-enacted Connally "hot" oil law in East Texas, adding that he would advise the committee when to put it into effect.

McDowell next testified as to the Mar. 5, 1935, meetings in St. Louis, held in Ashton's office and at the Coronado Hotel. Both of these meetings were mentioned in Jacobi's testimony as a government witness.

The St. Louis meetings, McDowell added, were called after a group of independent refiners had met at Kansas City on March 4, 1935, and appointed a committee to confer with the Tank Car Stabilization Committee.

At the St. Louis meetings the "plan" was again explained and various company representatives stated what refiners they would like to buy from.

McDowell said he returned to Tulsa March 6 and that the following day he was notified by Ashton that Arnott had advised him that it was time to put the "plan" into effect, that the Connally law would be effective in East Texas, and that code authorities at Washington felt that "we should go ahead with the plan."

Meeting Tuttle and Jacobi at lunch that same day, McDowell said they decided that the first thing to do was to call the companies that were buying so they divided up among them what companies to call.

He said he could not recall any discussion of price but that, being oil men, they had probably "talked shop which includes discussing the market."

The Mid-Continent official said that factors in arriving at an opinion of what the market is include "the prices you have bought at or know you could buy at and the same information about other buyers or sellers, what the brokers were saying, and also what the trade papers said—because they purport only to publish what their idea of a certain section of the market is; that is transactions between refiners and jobbers and consumers."

Donovan next brought out that on March 7, 1935, the Chicago Journal of Commerce was quoting a range of 3.50-3.75 cents for third grade and *Platt's Oilgram*, Oklahoma refinery market, was 3.625-3.75 cents.

Mid-Continent made its first purchase on March 14, McDowell testified. He denied that he had urged or recommended any other company to pay 3.75 cents.

Donovan then handed the witness Jacobi's market letter of March 15, 1935, in which it was stated "our committee decided on a price of 3.75 cents" for third grade next week. In explanation, McDowell said that the words were perhaps loosely used.

Jacobi was buying 3.75 cents and Mid-Continent, unable to buy at 3.625 cents, had to pay 3.75 cents, McDowell said, adding "we all thought the market was at least 3.75 cents."

In explanation of why no meetings of the Tank Car Stabilizing Committee were held after February, 1936, McDowell said, at the start of the afternoon session Dec. 14, that it was "like a snowball rolling down hill."

Substantial contacts had been worked out between the buyers and sellers and they went ahead, he said.

McDowell next testified as to how, at a meeting shortly after the oil code expired May 27, 1935, with the Schechter decision invalidating NIRA, Arnott urged the industry to endeavor to hold the gains made and carry on voluntarily the constructive work under the code.

Statements Cited

He said Arnott cited statements in newspapers of President Roosevelt, Donald R. Richberg, NRA general counsel, and Chairman Fahy of the Petroleum Administrative Board urging the industry to "carry on" — after the "death" of the NIRA.

Over objections from government counsel, Judge Stone permitted Donovan to read several of those newspapers to the jury. Government attorneys countered with other newspaper stories in which the President "warned" that the anti-trust laws were again in force.

During an argument as to how much of the NIRA was left after the Schechter decision, Frederick Wood, Sinclair attorney, who argued and won the Schechter case before the U. S. Supreme Court, arose and declared that the decision only invalidated the compulsory provisions.

"I think that Mr. Wood is too modest about his work," Lewin retorted. "He knocked out the whole NIRA, lock, stock and barrel."

Judge Stone sustained government counsel when Donovan sought to put in a NRA reemployment agreement signed by the Mid-Continent Petroleum Corp., in September, 1933.

"Everyone in the country signed one of those, whether he had three employes or 500,000," Chaffetz declared.

At a meeting of the Tank Car Stabilization Committee on June 6, 1935, it was felt that the committee's activities were "constructive" and that each company would have to continue buying gasoline anyway, so it was decided to ask Bourque to continue making surveys of distress gasoline in the Mid-Continent area, McDowell testified.

P. & C. Check Identified

Donovan next produced a cancelled check dated June 11, 1935, of the P. and C. Committee and voucher for $322.10, which McDowell identified as being in payment for his telephone calls as chairman of the Tank Car Stabilization Committee.

Closing his examination, Donovan took up each allegation in the indictment and McDowell categorically denied each charge.

McDowell insisted that his company had bought gasoline because it needed it and that "we would have bought it whether there was a Tank Car Stabilization Committee or not."

An emphatic denial was made by McDowell to the last question which was whether he reported to the trade journals, as prices paid by jobbers, the prices paid by major companies in their purchases from independent refiners; nor did he ever agree to do so, he added.

On cross-examination Lewin put in newspapers quoting the President's anti-trust law statement.

Met Steiger at Madison

Asked if he knew John Steiger, Tulsa market checker for *Platt's Oilgram*, McDowell said he met Steiger for the first time several weeks ago (Steiger was a government witness at Madison). He said he never talked with Steiger over the telephone. Lewin asked if McDowell knew whether Mr. Fitzgerald of Mid-Continent had given Steiger prices paid by major companies and the witness said he didn't know.

McDowell said he talked with

Keith Fanshier, petroleum editor of the Chicago Journal of Commerce, half a dozen times in 1935-36 and that the first time they had discussed the buying "plan", Fanshier appeared familiar with it.

All the prospective purchasers of distress gasoline mentioned by the Tank Car Stabilization Committee were named as defendants in the indictment, Lewin brought out.

Questioned on Purchases

The government attorney pressed McDowell as to why the major companies, if they needed gasoline and wanted to help the independent refiners had not bought during January and February, 1935.

McDowell said that Mid-Continent made only one purchase during that period because "we didn't need the gasoline." He also suggested that buyers are unwilling to buy when the market is going down as it did following the break-down of the tender board system and the "flood of 'hot' oil" in January, 1935. He pointed out that the "plan" was predicated on control of "hot" oil in East Texas.

To explain his point, McDowell said it was like two trees—a big one and a little one—blown across a telephone line during a windstorm. It would be useless to lift the little tree without lifting the big one, too; but when both trees are removed, the line snaps back to normal, he said.

"Well, that big tree was 'hot' oil slopping over into our territory," he continued. "Until that big tree was removed, it was useless to remove the little tree, which, in our case, was distress gasoline."

As evidence of the effect of the tender board system under the Connally "hot" oil law in 1935, McDowell declared that the price of gasoline had risen two cents within 30 days in the fall of 1934, when the first tender board was made up.

Lewin drew from McDowell the statement that helping the independent refiner was not the only reason for the Tank Car Stabilization Committee's activities.

McDowell estimated that Mid-Continent's gallonage in the mid-western area in 1935 was about 200,000,000 and about 10 per cent higher in 1936. With these figures Lewin asked McDowell to figure out "how much money your company would make from a one-cent rise in the tank car price."

The government attorney sought to show that the major company representatives intended to help themselves when they drew up the "plan."

McDowell declared that stabilization of retail markets, which he said was one of the committee's aims, would help his company, as part of the industry, and "to that extent we would profit."

Court recessed until Dec. 15, just as Lewin was asking about a letter dated April 17, 1935, which he said McDowell wrote to Charles S. Smith, Cleveland, vice president of National Refining Co.

DAILY AVERAGE PRODUCTION IMPORTANT DISTRICTS
American Petroleum Inst. Figures

	Week Ended Dec. 11 Barrels	Dec. 4 Barrels
Oklahoma City	130,600	114,400
Total Okla....	560,200	556,100
East Texas...	417,800	416,900
Total Texas..	1,319,000	1,304,350
Rodessa	42,700	43,100
Total La.	239,300	246,300
California	712,900	703,100
E. of Rockies.	2,701,550	2,683,900
Total U. S.....	3,414,450	3,387,000
Crude imports.	109,860	89,430
Tot. new sup'ly	3,524,310	3,476,430

AUSTIN, Texas, Dec. 13.—Trial of the Texas anti-trust suit against 15 oil companies and two trade associations has been set for Oct. 3, 1938, by District Judge J. D. Moore. The suit was started Nov. 12, 1931, by Gov. James V. Allred, when he was attorney general, was dismissed by the district court and last June was reinstated by the Texas Supreme Court.

Gas and Fuel Oil Stocks Decline 1,035,000 Barrels Last Week

N. P. N. News Bureau

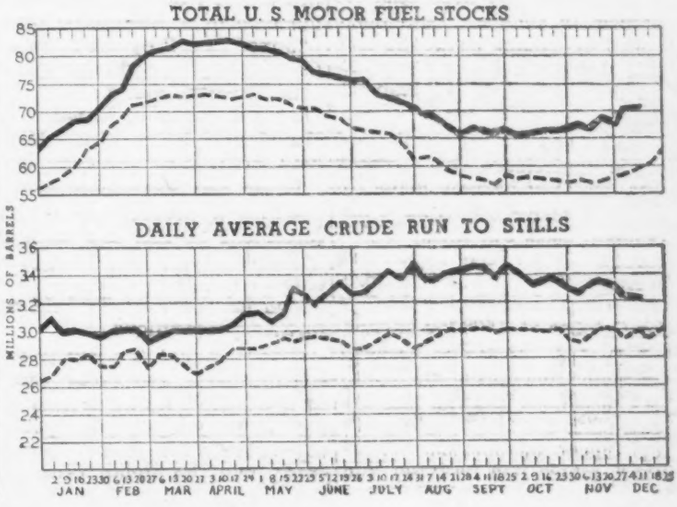
NEW YORK, Dec. 14. — Gas and fuel oil stocks declined 1,035,000 barrels the week ended Dec. 11, to 117,134,000 barrels, while total motor fuel stocks increased 270,000 barrels, to 66,643,000 barrels, the American Petroleum Institute reports.

Crude runs to refinery stills declined further 33,000 barrels to 2,867,000 barrels daily average, following a decline of 106,000 barrels the previous week. The largest decline was 40,000 barrels at Texas Gulf plants and a similar one at East Coast plants. Increases of 26,000 barrels at Inland Texas, 13,000 barrels at Appalachian and 9000 barrels in Oklahoma-Kansas-Missouri plants balanced some of this decline. Operations at reporting plants declined from 78.3 to 77.4 per cent the past week.

Stocks of motor fuel piled up at refineries by 750,000 barrels, standing at 36,903,000 barrels Dec. 11. In-transit and terminal stocks were depleted by 469,000 barrels, and stood at 23,176,000 barrels at the end of last week. Stocks of unfinished gasoline declined 12,000 barrels, to 6,564,000 barrels.

Sizeable changes in motor fuel stocks in the various refining districts, were: East Coast, 426,000 barrel decline and Oklahoma-Kansas-Missouri, 270,000 barrel decline; California, 435,000 barrels increase; Louisiana Gulf, 241,000 barrels increase; and Indiana-Illinois-Kentucky 165,000 barrels increase.

Gas and fuel oil stocks showed the largest declines in these districts: East Coast, 500,000 barrels; Indiana-Illinois-Kentucky, 340,000 barrels; Texas Gulf, 125,000 barrels; Oklahoma-Kansas-Missouri 100,000 barrels; and California, 110,000 barrels.



CURRENT REFINERY OPERATIONS

Districts	Per Cent Capacity Reporting	Daily Average Crude to Stills (Barrels) Week Ended		Per Cent of Reporting Capacity Operated Week Ended		Stocks Thousands of Barrels Total Finished and Unfinished Motor Fuel*		Total Finished Gas & Fuel Oil		Cracked Gasoline Production % Total Capacity Reporting	Daily Av. Production Barrels Week Ended	
		Dec. 11	Dec. 4	Dec. 11	Dec. 4	Dec. 11	Dec. 4	Dec. 11	Dec. 4		Dec. 11	Dec. 4
East Coast	100.0	536,000	576,000	80.1	86.1	17,888	18,314	14,030	14,526	100.0	112,000	127,000
Appalachian	88.4	103,000	90,000	79.8	69.8	2,814	2,782	950	1,064	94.6	21,000	22,000
Ind., Ill., Ky.	92.4	425,000	421,000	86.9	86.1	10,527	10,362	7,000	7,341	98.5	140,000	140,000
Okla., Kans., Mo.	84.7	276,000	267,000	72.1	69.7	6,288	6,558	3,708	3,822	90.3	67,000	70,000
Inland Texas	56.6	132,000	106,000	65.7	52.7	2,134	2,117	1,845	1,834	71.7	39,000	34,000
Texas Gulf	95.7	654,000	693,000	82.1	87.0	9,936	9,877	11,656	11,781	98.0	157,000	151,000
La. Gulf	96.6	135,000	145,000	80.4	86.3	1,973	1,732	3,487	3,436	100.0	28,000	30,000
No. La., Ark.	63.7	48,000	45,000	82.8	77.6	403	426	532	539	77.5	8,000	6,000
Rocky Mt.	69.7	43,000	48,000	69.4	77.4	1,563	1,523	640	650	85.4	9,000	11,000
California	90.9	515,000	509,000	69.0	68.2	13,117	12,682	73,286	73,176	98.0	76,000	78,000
Total Reporting	89.0	2,867,000	2,900,000	77.4	78.3	66,643	66,373	117,134	118,169	94.8	657,000	669,000
Estimated U. S. Total (Bur. of Mines Basis)		3,200,000	3,230,000			70,513	70,193	120,154	121,319		735,000	745,000

*Includes stocks at refineries, in bulk terminals, pipe lines and in transit.

October Demand Supports Winter Sales Prospects

N. P. N. News Bureau

WASHINGTON, Dec. 13. — Another hundred-million barrel month is reported by the U. S. Bureau of Mines for domestic demand of all refined products in October.

First topping this mark in December, 1936, and again in July, August, September, and October this year, the prospects of the oil industry for winter demand for its products are given added impetus by the October statistics.

Total demand for October was 100,434,000 barrels as compared with 102,686,000 barrels (revised) for September.

A decline of nearly 2,000,000 barrels in October motor fuel demand was more than made up by increased demand for kerosine, gas oil, distillate fuels and residual fuel oils. The demand for asphalt and road oil declined 1,300,000 barrels.

On the other hand losses were reduced by over 1,200,000 barrels in October. Losses are added to demand figures so that this decreased loss reduces total demand figures correspondingly.

Daily average production of crude petroleum in October was 3,577,800 barrels, about 16 per cent above the average for October, 1936, but nearly 90,000 barrels below the September average. The bureau had forecast daily average production for October at 3,568,100 barrels.

Indicated domestic demand for motor fuel during the month was 45,361,000 barrels, the bureau said, almost 3,000,000 barrels below its forecast of demand, which had been set late in September at 48,550,000 barrels.

Thus, for the fourth consecutive month, production was greater than the bureau's forecast, while demand for motor fuel was below the estimate.

Stocks of crude petroleum Oct. 31, amounted to 308,472,000 barrels, compared with 292,271,000 barrels on Oct. 31, 1936, — over 16,000,000 barrels more than on a comparable date last year. At the end of September, 1937, stocks totalled 309,742,000 barrels.

At the same time, withdrawals from stocks of gasoline during the three months preceding October have been less than anticipated, according to earlier reports of the bureau, and in October, a month when these stocks are generally reduced, they rose 2,657,000 barrels, to a total of 68,037,000 barrels Oct. 31. On the same date last year, stocks of finished and unfinished gasoline were 57,662,000 barrels, and on Oct. 31, 1935, they were 49,798,000 barrels.

Although demand for gasoline was only 2.5 per cent higher in October than in the same month last year, crude runs to stills during the month reached a daily average of 3,388,000 barrels, 13 per cent higher than in October, 1936, another Interior Department report shows.

Exports of motor fuel in October continued high, the bureau reports, totaling 3,830,000 barrels, or 54 per cent higher than in October a year ago.

State Aid Asked In Michigan Case

DETROIT, Dec. 14. — Examination of the 21 Detroit gasoline retailers, originally set to begin Dec. 14 and to continue Dec. 21, has been postponed, according to the Wayne County prosecutor's office, pending the outcome of a restraining order obtained Dec. 2 by the Argo Oil Co. and Roy R. Fisher, its president. Fisher, along with the others, was named in warrants charging violation of the Michigan Fair Trade Practice law.

While the restraining order, obtained to prevent further enforcement of this law until it is tried on its merits, applies only to the Argo company, the action has temporarily held up further prosecutions.

Charging that the law is unconstitutional, the order came as a result of an injunction by the company against the police department, the county prosecutor, and the Retail Gasoline Dealers Assn. of Michigan. It halts, for the time being at least, the efforts of these parties to further enforce the law.

County Prosecutor Duncan C. McCrea has appealed to State Attorney General Raymond W. Starr to continue the enforcement of the law. Starr was not named in the injunction and is free to continue action. At the beginning of the week the prosecutor's office indicated that Starr had indicated his willingness to help and that he would confer with McCrea further in the matter this week.

The warrants against the gasoline retailers charge selling below cost, giving unearned discounts, or both.

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Marland's Conference

N. P. N. News Bureau

TULSA, Dec. 14.—Governor Ernest W. Marland of Oklahoma has postponed his oil price and conservation conference until Jan. 24. The date conference had been set for Jan. 17.

The governor of Arkansas has undergone a surgical operation, it was said in explanation of the postponement. The meeting will be held at Hot Springs.

Chief executives of Kansas, Arkansas, Utah, Michigan, Colorado, New Mexico, California, West Virginia, and Wyoming replied they would attend or send representatives. Governors of Texas, New York, and Tennessee declined to participate. Other producing states have not yet replied.

All's Quiet Along The "Cracking" Potomac

By ARCH L. FOSTER, Technical Editor

The Treaty of 1937 closes a chapter in cracking development which has been one of the most prolific in achievement and one of the most confusing in its purposes and cross-purposes in the history of American industry. Oil cracking as we know it has developed almost wholly in the last 20 years. It was inevitable that aggressive leaders in this field should find their paths of endeavor crossing, and that conflict of accomplishment and of purpose should result.

The agreement reached a few days ago eliminates most of this conflict, this interference of interests. From the time of the far-reaching pioneer work of Cross, of Dubbs, and other early researchers in cracking, two strong groups have been formed. One of these, Universal Oil Products Co., was for years independent of specific refining interests. The Gasoline Products Co. group, formerly and now, represents the directing and correlating head of the cracking development activities of the largest single group of oil organizations in the world—Standard Oil Companies of New Jersey and Indiana, The Texas Co., Atlantic Refining Co., etc. In the "Peace of 1931," Universal was purchased by Standard Oil Co. of California and the Shell interests, and ownership later shared with some other companies.

For all present purposes the cracking patent structures of these two groups were and are built around two patents, generally considered as basic in character—Universal's Dubbs patent dealing with "clean circulation" in the cracking still in one way, and Texas Co.'s Behimer patents dealing with the same principle in a somewhat different manner. More specifically, the Dubbs patent referred to and used return of reflux material to the cracking still without exact specification of the manner of its return. The Behimer claims refer to return of the same type of material by means of a pump or mechanical means. The Dubbs patent expires late in 1938; the Behimer patent, held in the Patent Office on interferences, etc., was issued in 1932, and runs until 1949.

Speaking plainly, the clean circulation principle as represented by Dubbs is open to the world after 1938. In fact a good possibility is that Dubbs licensees would be subject to conviction for infringement under the Behimer patents, assuming of course that the courts validate the Behimer claims. With a long and extremely costly record of litigation behind the industry, the principals in this matter did the eminently sensible and laudable thing—clarified the aggravating situation through the purchase by the Dubbs interests of a non-exclusive licensing right, and immunity under the patents of the Gasoline Products, group, specifically here the Behimer patents, property of The Texas Co.

The two immediately beneficial results of this action are the cessation of litigation and dismissal of infringement suits, and the elimination of a potentially dangerous situation for present and prospective licensees. Refiners may choose the type of license they wish, decide from which group it will be obtained, with certain knowledge that suits are practically eliminated from the realm of probability. Literally millions of dollars will be saved licensing companies and refiners, in litigation costs.

An even greater expense will be stopped. The time, energies, and work of hundreds of executives, attorneys, engineers and others will be free for constructive effort. The brains of all these will be directed to making better cracking processes, not crowding court dockets and fattening revenues for the legal fraternity whose talents can likewise be used constructively for the industry and their clients.

The returns will come in the form of advancing technology of cracking, in meeting demands for tomorrow's super-fuels and chemicals and in peace along a 20-year battlefront.

Refining Technology

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Talco Crude Yields 42% of Premium Asphalt R-379

Talco crude, with special asphalt properties, yields 42% of very high grade asphalt products, with 70 octane number gasoline as the other chief product. Article gives details of the design of this combination topping-cracking-reforming-asphalt making unit.

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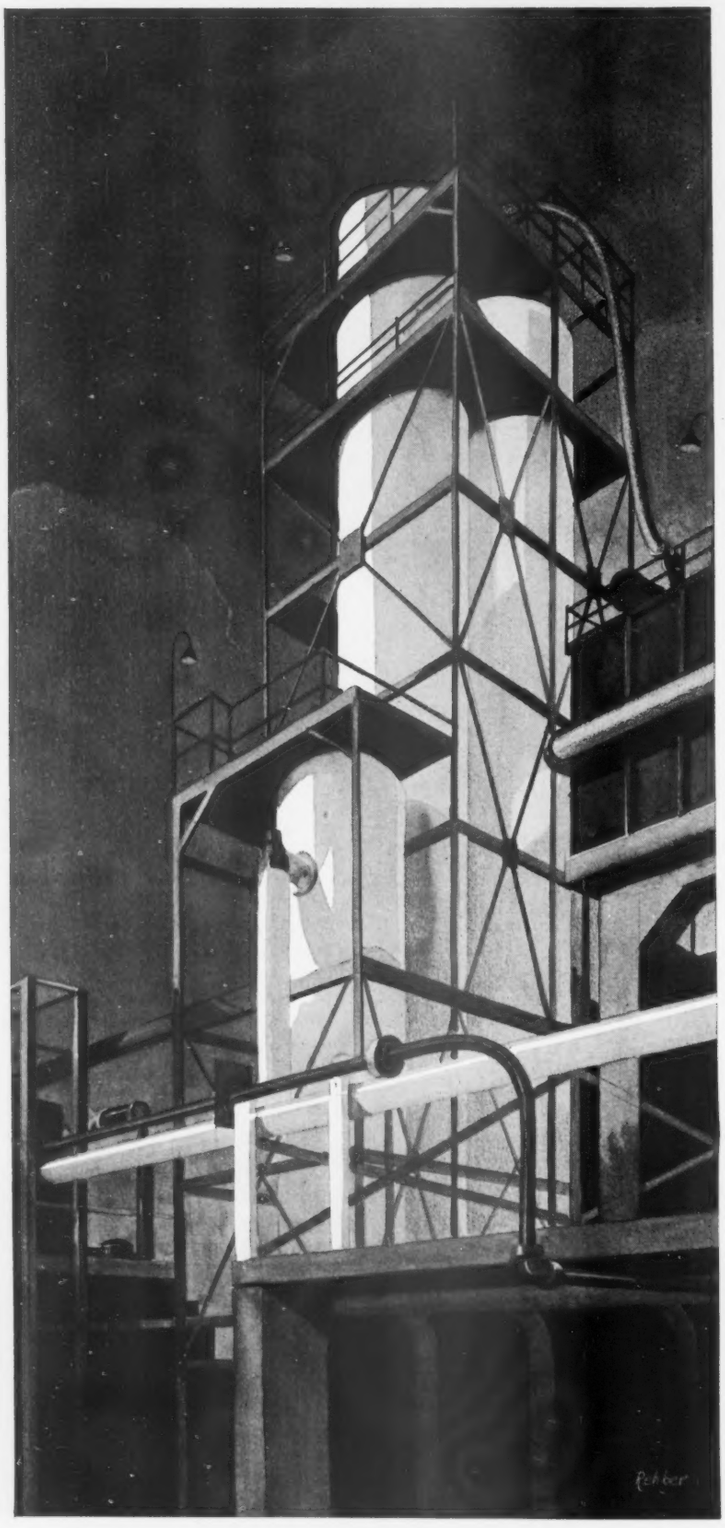
THERMAL



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POLYMERIZATION

Airplane view of Talco Asphalt & Refining Co.'s plant at Mt. Pleasant, Texas. Note the employes' houses, and the grove of trees around the artificial lake

715
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Talco Crude Yields 42% of Premium Asphalt

By ARCH L. FOSTER, Technical Editor

Abstract

● Refinery to crack overhead fractions of Talco crude, and produce asphalt from the heavy reduced crude, costing $1,500,000, built by Talco producers to handle 34,000,000 barrels estimated crude reserve owned by company in that field.

Refinery is topping, cracking, reforming, 7000 barrels of crude per day. Equipment includes four U.O.P. center wall, updraft furnaces, asphalt reducing shell stills, fractionating towers, vapor recovery unit, etc. Two streams are cracked, one stream reformed, and kerosine, furnace oil, etc. may be taken when needed.

Asphalt contains about 4.5% sulfur, and shows properties practically identical with Mexican, rather than domestic asphalts.

MT. PLEASANT, Texas

HAVING LARGE producing interests in the Talco field of northeast Texas, the owners of the new Talco Asphalt and Refining Co. were of course seriously interested in the nature of this particular crude and the types of products which could best be manufactured from it. Discovering the most outstanding characteristic of this rather singular crude to be its asphalt content, they formulated a plan to capitalize on these qualities, and the result was the organization of the present company and the construction of the very modern $1,500,000.00 plant which went into full operation about the middle of October, 1937, refining mainly a complete line of asphalts and allied products, and motor fuels.

The plan of the company, and the design of the plant which was adopted is a typical example of the careful, scientific and meticulously planned methods employed by the petroleum industry to utilize to the best advantage its raw material in its innumerable types and kinds. Talco crude yields by actual plant operation about 42% of asphaltic products, the exact yield being dependent of course on the specifications of the particular products being made at a given time. The crude has a gravity ranging around 20 to 22° A.P.I., and a sulfur content of the order of 2.7%. The overhead distilled fraction of the crude is normally cracked and reformed to gasoline of 70 octane number or higher, although side cuts of kerosine, gas or furnace oils may be taken off, as well as cut-back naphthas for use in making road oils and other products.

The plant is located just outside Mt. Pleasant, Texas, on a tract of 76 acres, is served by the Cotton Belt Railway, and operates its own water, light and sewage systems. Residences for six operating officials and engineers are provided at the plant and an artificial lake of 4,000,000 gallons is nearby, around which landscaping plans are being made, as well as for the entire tract. Storage for 350,000 barrels of crude and products is provided, of which 156,000 barrels is for finished asphalt and its products. Designed for 5200 barrels per day, it has been handling about 7000 barrels daily.

It is operating under Dubbs license.

Design of Refinery

The primary units of the refinery include four U. O. P. center wall updraft furnaces. One furnace is the combined crude and asphalt heater, the three remaining furnaces are the naphtha reformer, and the light and heavy gas oil cracking units. Two shell stills are used for reducing and blowing asphalt to specifications. Three fractionating towers, a stabilizer column and a vapor recovery column, reaction chamber and flash tower, and three main side-stream stripper towers complete the major items of distillation equipment. Two 378 B. H. P. Vogt curved-tube boilers designed for 200 lbs. pressure and operating at 175 lbs. supply steam for all purposes. They are operable at 200% rating or more.

The crude heater uses all carbon steel tubes, 54 in the

Loading rack to handle 15 tank cars simultaneously, which capacity will be doubled in the near future

convection bank, 40 tubes in the radiant section, with 14 tubes in the asphalt heater section. This is the only double heater in the plant. The internal dividing wall is set off-center, to provide greater distance from tubes to radiating heat source for the asphalt section. The two sides of this heater are fired independently.

The heavy oil cracking heater uses 112 tubes of 4-6% chrome, ½% molybdenum in parallel. The light oil heater uses 105 tubes of the same steel in parallel, and the reforming coil uses 108 tubes.

The crude fractionating tower is 8′ x 70′3″ x 7/16″ plus a 25′ skirt, and contains 28 cast iron bubble trays. The cracked oil fractionating tower is 8′ x 64′, with part of the wall ¾″ and the remainder 1″, gannister lined. It is divided into three sections, separated by a chimney and catch-basin, above which are 11 trays, below are 5 trays, with 10 side-to-side pans in the bottom section. A small side-strip tower for cut-back and similar naphthas is 2′6″ x 10′, equipped with three trays. The three side-strip towers on the crude tower side cuts are each 3′6″ x 20′6″, with 8 trays. A stabilizing column of 4′ x 43′6″ with 63/64″ wall has 26 bubble trays, and the absorption column is the same dimensions with 16 trays.

The reaction chamber is 6′ x 40′ x 5½″ wall, while the flash chamber is 10′ x 40′ x 2″ wall, gannister lined.

The Fluor water cooling tower has a capacity of 5,600 g.p.m., and is approximately 198′ x 35′ x 18′. All charging and hot oil pumps are Worthingtons and the low pressure cooling and recycle pump has 4-6% chrome, ½% moly casing with stainless steel impellers and wearing rings.

The power plant includes:

2 Worthington 300 hp. 4-cycle gas engines;
1 Worthington 150 hp. 4-cycle gas engine;
2 GE 250 KVA generators, 480 volt, 400 r.p.m.
1 GE 125 KVA generator, same.
2 Worthington 870 r.p.m. air compressors, 445 cu/ft./min. at 125 lbs. pressure.

Tower temperatures and pressures are controlled automatically by air-operated valves. Liquid levels in the cracked distillate tower and in the vacuum column are indicated by three differently colored lights placed vertically on the switchboard, which show high, medium and low levels for the operator's guidance. The boiler and power unit operations are almost completely automatic, one man sufficing to observe and control both units.

The cooling tower will supply water at 85°F. under summer conditions in this subtropical climate. Water is obtained from a 60-foot thick sand and 360 feet below the surface, the water having only one grain of hardness, requiring no treatment therefor, but needs a slight acid treat to make certain of avoiding caustic embrittlement. The plant is encircled by a 6″ water main for fire protection; the artificial lake is reserve supply for the plant, and dual pumping facilities are available, ready for an emergency.

To avoid the necessity for a complete shutdown in case of accident to one part of the refinery, the electrically driven pumps are equipped with steam turbines, which are kept hot by bleeding a small amount of steam through continuously, and take up the load automatically if current failure disables the motors. Cracking, topping and asphalt units may be operated independently if occasion demands it.

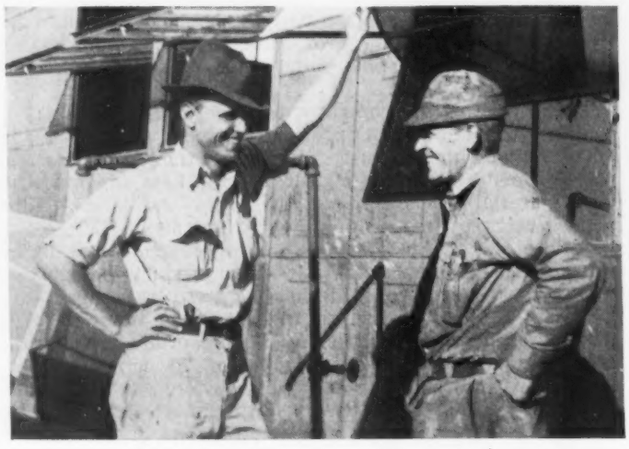
Typical Operation of the Plant

Talco crude reaches the refinery via Talco Pipe Line Co.'s 18 miles of 5½″ O.D. line (owned by the same group which owns the refinery), is stored in two 10,000 barrel and two 55,000 barrel tanks. The crude charging pump sends it through a heat exchanger on the cracked distillate vapor line, the crude reaching a temperature of about 250°F. It settles out water, salt and foreign material in a horizontal settling drum, is raised to about 325°F. in exchange with low-pressure cooling oil, and passes to the convection section of the crude heater, through the hip tubes and one radiant section to the fractionator. Straight-run gasoline passes over the top, and three cuts, naphtha, kerosine and gas oil, are taken from the three catch-basins in the tower, stripped with steam in side towers and run to storage as commercial products or as charging stocks for the cracking and reforming heaters.

The reduced crude passes from the tower bottom to a steam stripper and next is heated to the required temperature of 650°F. to 675°F. in the radiant section of the heater opposite that which heats the crude. From this heater it enters the vacuum tower maintained at 29½″ of mercury or ½″ pressure, absolute. A gas oil cut is taken from this tower top, which is used as reflux and eventually forms part of the heavy oil cracking stock. The construction of the asphalt heater as referred to above, and the low temperature necessary to flash off the gas oil in the tower enable the operators to eliminate over-heating the heavy material, an important factor in the quality of the final product made.

The heavy gas oil fraction, taken from storage, is passed through the absorption column countercurrent to the uncondensed gases from the cracked distillate and stabilizing receivers. Enriched by the heavier vapors so absorbed, this charge is treated with lime slurry for corrosion prevention, and enters the cracked fractionator at the top of the stripper pan section below the center well, vaporizing the light material and dropping the gas oil to the bottom from where it is pumped to the heavy oil heater. From the center well and catch-basin in this column a light oil charge is taken and sent to the light oil heater for cracking.

The charges to these two furnaces, at temperatures of, for example, 640°F. and 540°F. and pressures of 620 and 450 lbs. for the heavy and light oils respectively, enter the reaction chamber at the top, and from the bottom pass together into the flash chamber after passing through a valve which reduces the pressure to about 60 pounds. Straight-run naphtha or gasoline from storage picks up heat from the heavy cracked residuum from the flash chamber bottom, and enters the reforming heater, reaches a temperature of,



On the left is J. C. Reed, superintendent of maintenance for Talco Asphalt and Refining Co.; on the right is W. D. Dumas, refinery electrician

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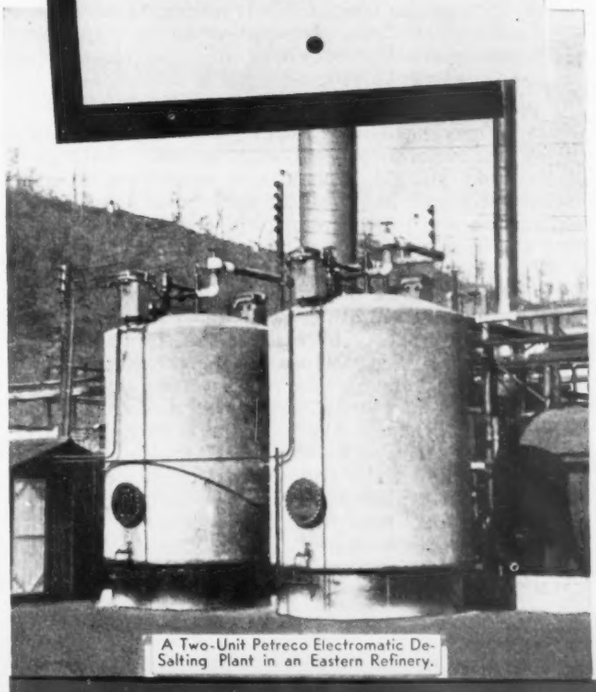

A Two-Unit Petreco Electromatic De-Salting Plant in an Eastern Refinery.

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PETRECO

J. K. MacKinnon, manager of Talco Asphalt & Refining Co., Mt. Pleasant, Texas

C. O. Garbrecht, superintendent of refining, Talco Asphalt & Refining Co.

for example, 980°F., passes a pressure reducing valve, and enters the flash chamber direct, bypassing the reaction chamber. The commingled vapors pass to the fractionator, entering below the stripper pans. The tower is refluxed with cracked distillate from the receivers and the overhead vapors are fractionated, to the desired endpoint. These vapors preheat the crude charge, and are condensed to receivers, from which they pass to the stabilizing column. The column bottoms, stabilized cracked distillate, is reboiled in an outside drum reboiler, using heat from a part of the light oil cracking charge which is bypassed to this reboiler and returned to the main cracked distillate column three trays above the center well. Stabilized cracked distillate is drawn from the reboiler bottom, is doctor treated, and inhibited, using UOP inhibitor. Vapors from the top of the stabilizer column are robbed of light gasoline by the heavy oil cracking charge as shown above. The stripped gases supply all the fuel needed in the plant except that used in the residences and in the power plant gas engines, where natural gas is used.

This unit has been producing 68-70 octane number gasoline since late in October, without the use of lead, and is expcted to make about 2500 barrels per day when the plant settles down to steady, routine operation.

Typical inspection data on the crude and different products are shown in the accompanying table.

TABLE 1

Analyses of Talco Crude, and Products Made

	Crude	Light Oil Feed	Hvy. Oil Feed	Raw Oil Feed	Re-former Feed	Gasoline
Grav. API	22.6	23.0	13.3	29.4	60.9	61.4
IBP° F.	133	223	300	505	112	84
5%	277	429	514	541	145	110
10%	357	452	536	552	171	125
20%	502	464	558	571	199	156
30%	602	472	574	591	228	187
40%	659	479	594	613	250	219
50%	681	486	622	638	276	245
60%	694	495	644	664	299	275
70%	706	504	657	690	320	302
80%	714	515	692	701	339	330
90%	...	534	709	722	366	366
95%	...	550	725	736	...	394
E. P.	...	578	750	740	399	397
Sulfur, %	2.7	...	...	...	...	...
Octane No.	...	...	...	...	...	70
Cold Test, 0° F.						
Vis., @ 100—375 SUV.						

Cracked Residuum: Grav. 0.3 API; Vis. @ 122,77 Furol; B. S. & W. 0.6%, Flash, Cleve. O.C. 275° F. Cold Test 45° F.

From the large asphalt fraction an imposing list of products may be made. Roofing flux, rapid and medium-curing cut-backs and penetration asphalt; water-proofing, composition shingle asphalt and numerous others. The asphalt produced has a sulfur content of about 4.5%, low penetration and a good temperature susceptibility. Operators say that roofing asphalt can be taken direct from stream. All but one or two "freak" products on the market have been made or can be made from this residuum.

This asphalt emulsifies well and easily, officials say. Tests of this property by emulsifying companies have resulted in entirely satisfactory products. Shingle grade asphalt, and saturants are now being refined, as well as brick filler asphalt and other fillers. Waterproofing asphalt is made direct, without oxidation. Almost any grade from 50 to 300 penetration can be taken for blowing down to coating asphalt, they state. However, officials also stated that oxidation is not needed to improve the temperature susceptibility of this Talco product.

Exhaustive tests show this asphalt has no resemblance

Night view of Talco plant in operation. The entire plant is lighted by six 74-foot floodlight poles, surmounted by one to three 1500-watt units on each pole

to a Mid-Continent asphalt, nor does it resemble any other domestic grade, they also stated. It is more like the Mexican asphalts, being high in sulfur and in specific gravity. Most domestic asphalts show a relatively low specific gravity; the product from Talco crude, up to 300 penetration has a specific gravity higher than 1. The specific gravity of 30 penetration is 1.050; for 180-200 penetration it is 1.024. These and other properties are considered by the company's asphalt technologist, C. L. Brock, to make this asphalt especially applicable to a large number of products, and its possibilities have not yet been completely investigated. An extensive research program is planned to study the application of the plant's products to the widest possible variety of commercial uses.

The organization is headed by Capt. J. F. Lucey, known wherever oil men are known, in the Southwest especially; D. H. Byrd, equally well-known; Jack Frost and Ralph E. Fair, both of whom have seen many years of active experience in oil exploration and production. With an estimated 34,000,000 barrels of reserve production controlled by the company in Talco field, the plant will have a plentiful crude supply for many years to come.

Refinery operating officials are also well known in the southwest. General manager is J. K. MacKinnon, with 18 years of experience in every phase of refining practically every type of crude, including heavy Mexican asphalt crudes. C. O. Garbrecht is superintendent and also has years of asphalt refining experience to bring to the operation of this plant. Chief chemist is J. M. Dom, with several years' experience in manufacturing asphalt. J. C. Reed is maintenance engineer. The management of the company's offices is in the hands of "Joe" Dranguet, who has handled every kind of accounting and allied work known to the average refining company. The plant requires 45 men to operate it.

The writer wishes to acknowledge the kindly and willing assistance of these men, especially Messrs. MacKinnon, Garbrecht and Brock, in assembling the data given in this short article covering the main details of the new plant.

Panoramic view of Talco plant, from top of water cooling tower

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Heats of Combustion of Olefins Redetermined More Accurately

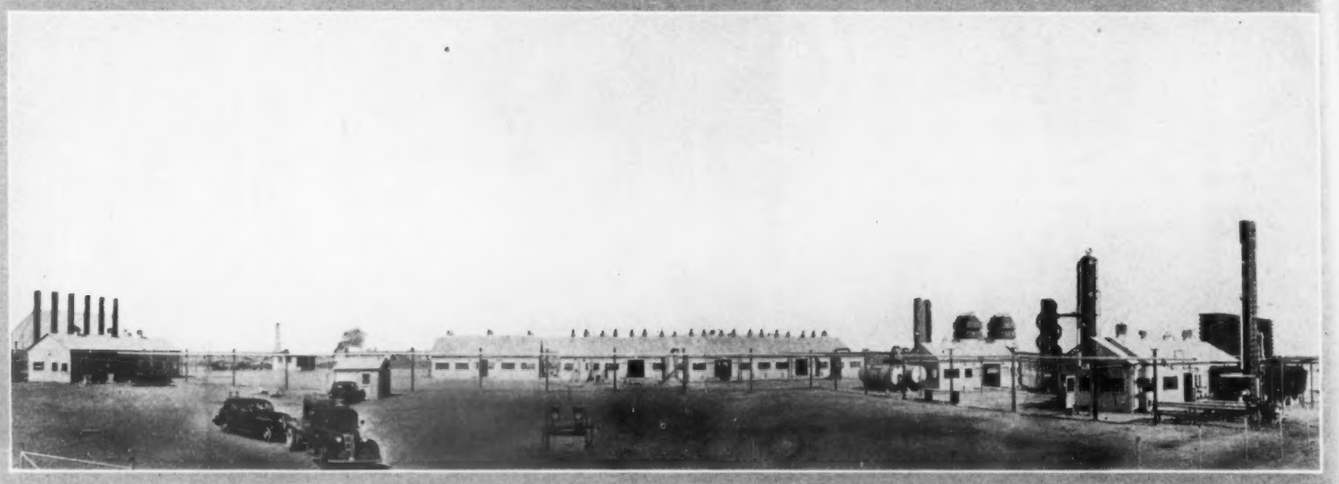
New values for heats of combustion of ethylene and propylene are given as 1410.97 ± 0.30 and 2057.42 ± 0.62 international kilojoules per mole respectively by R. D. Rossini and J. W. Knowlton in recently published Research Paper RP1024 of the National Bureau of Standards. These are the heats evolved in combustion in oxygen at 25° C. and one atmosphere pressure to form gaseous carbon dioxide and liquid water. Estimated uncertainties of previously existing data is said to be, respectively, about 75 and 12 times that of the new values. A calorimetric method was employed.

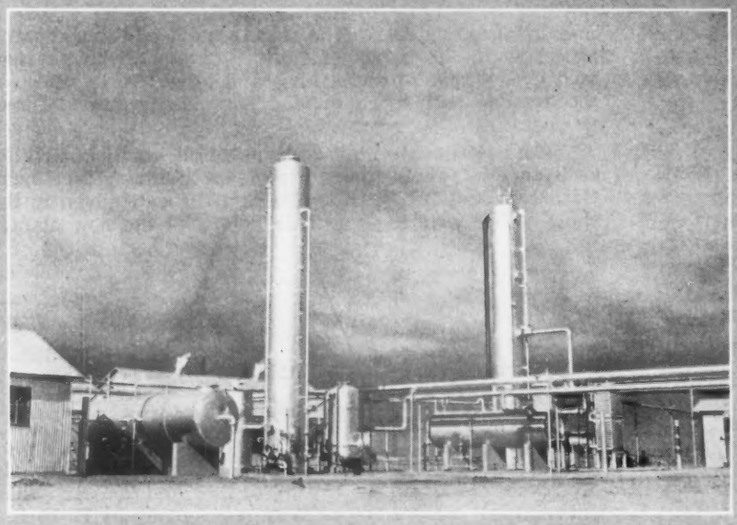
The data was used to obtain values for heats of combustion and formation of normal olefin (alkene) 1) hydrocarbons in the gaseous state. Values were computed with an expression of the form: $dH = A + Bn + D$ where dH is the heat of formation, A and B are constant for a given temperature, n is the number of carbon atoms in the molecule C_nH_{2n}, and D is a term given the deviation from linearity.

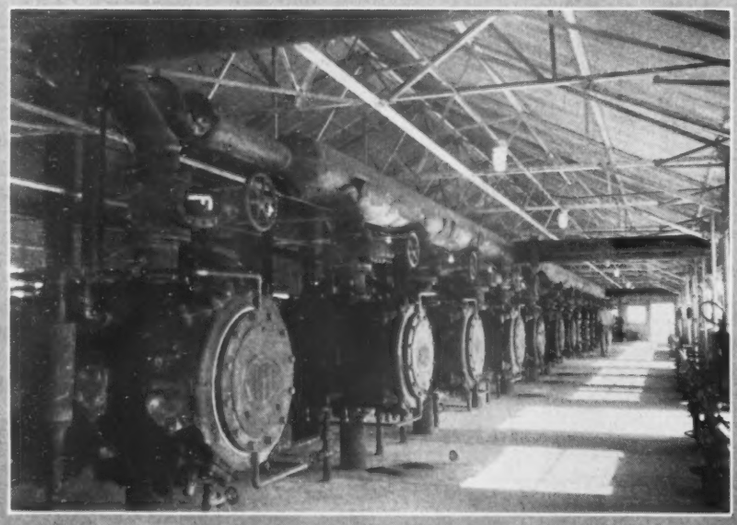
Selected "best" values for heats of combustion are tabulated herewith:

	Kilocalories per mole
Ethylene	337.25 + 0.07
Propylene	491.09 + 0.15
Normal butene-1	649.66 + 0.18
Normal pentene-1	806.78 + 0.32
Normal hexene-1	963.90 + 0.45
Normal heptene-1	1120.90 + 0.60
Normal octene-1	1277.90 + 0.70
Normal nonene-1	1434.90 + 0.80
Normal decene-1	1591.90 + 0.90
Normal C_nH_{2n} (n>5)	$21.90 + 157.00n \pm (0.10n - 0.10)$

These values as well as heats of formation are given in Bureau of Standards Research Paper RP1028. Both of the papers are available from the Superintendent of Documents, Washington, at 5 cents each.







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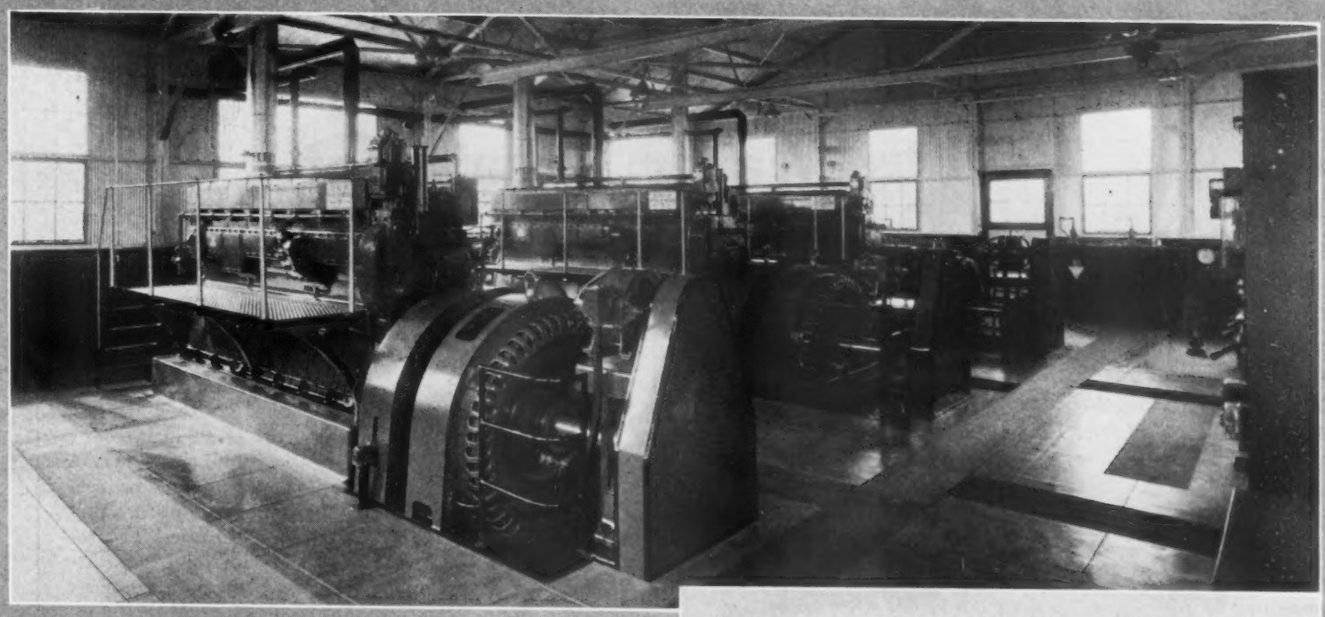

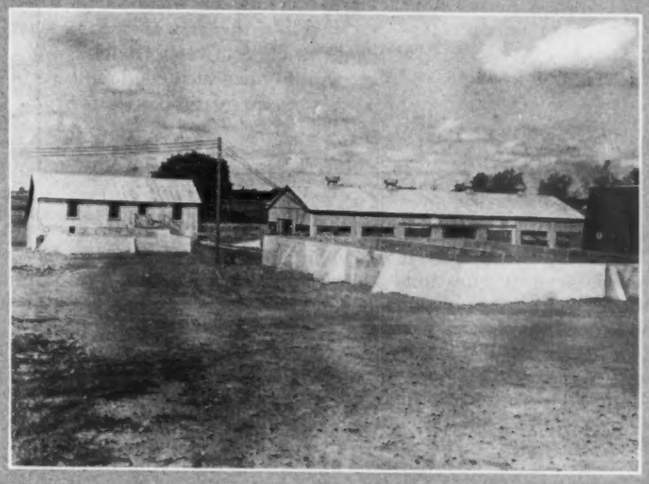

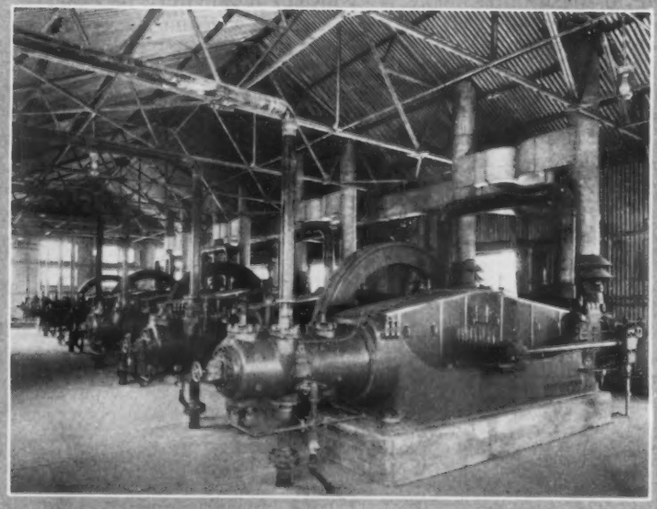

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Some Properties of Colloids, And Their Use In Water Treatment

By L. DREW BETZ*

(Presented under the title, "Colloidal Chemistry and Its Application To Water Conditioning", before the Technical Section, Western Petroleum Refiners Association, Wichita, Kans., Sept. 21, 1937).

● Colloids lie between the true solutions of materials and the true suspension state of subdivision. Their particle size is submicroscopic and are formed of groups of molecules and range from one millimicron to one micron in diameter. A millimicron is 0.001 micron, equal to four one-hundred millionths of an inch.

Two types of colloids exist, the protective and the reactive. The protective type sheathes solute or suspended particles preventing their coalescence during precipitation and deposition on enclosing surfaces. The reactive type has a chemical reaction with solutes or suspended substances, and will remove them, magnesium and calcium salts for example, from solution.

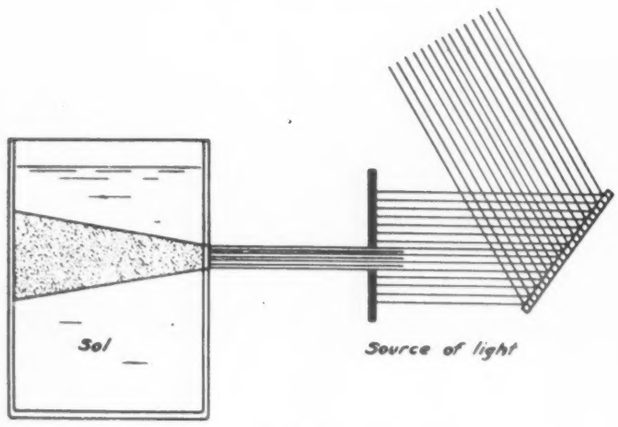
Some colloids are called hydrophilic or water-retaining; the opposite type is called hydrophobic or water-repelling. Colloids are not cure-alls for water troubles, but should be applied to cases and under such conditions as to take advantage of their very useful properties for this purpose.

IN ORDER that we may all have a clear understanding of the subject of colloid chemistry, it will be necessary to go back to some of our elementary chemistry. To those of my audience who are chemists, may I ask that you bear with me for just a few moments in covering these elementary phases.

Colloid chemistry is one of the new branches of this science. It has not been so long ago that in speaking of a colloid most of us scratched our heads in wonderment. But very little was published on the subject. Today, however, this condition is no longer present and our knowledge of this interesting branch of chemistry has increased materially. While this statement is true, there is not any great abundance of published data on the subject in reference to its application to water conditioning.

It has not been so long ago that the field of water conditioning as a whole, was exploited by quacks of the worst sort. The advancement of the knowledge of crystalloid chemistry, however, soon exposed this group and one by one they are being driven from this field. Because of the meager knowledge of colloid chemistry, some of them are now attempting to invade this field. We consider it our duty to assist in their complete rout and we therefore welcome the opportunity of explaining the basic facts of colloidal problems. It is with the hope that this will lead to the ability of my listeners to distinguish between quackery and true science in this field.

*W. H. and L. D. Betz Co., Philadelphia, Penna.



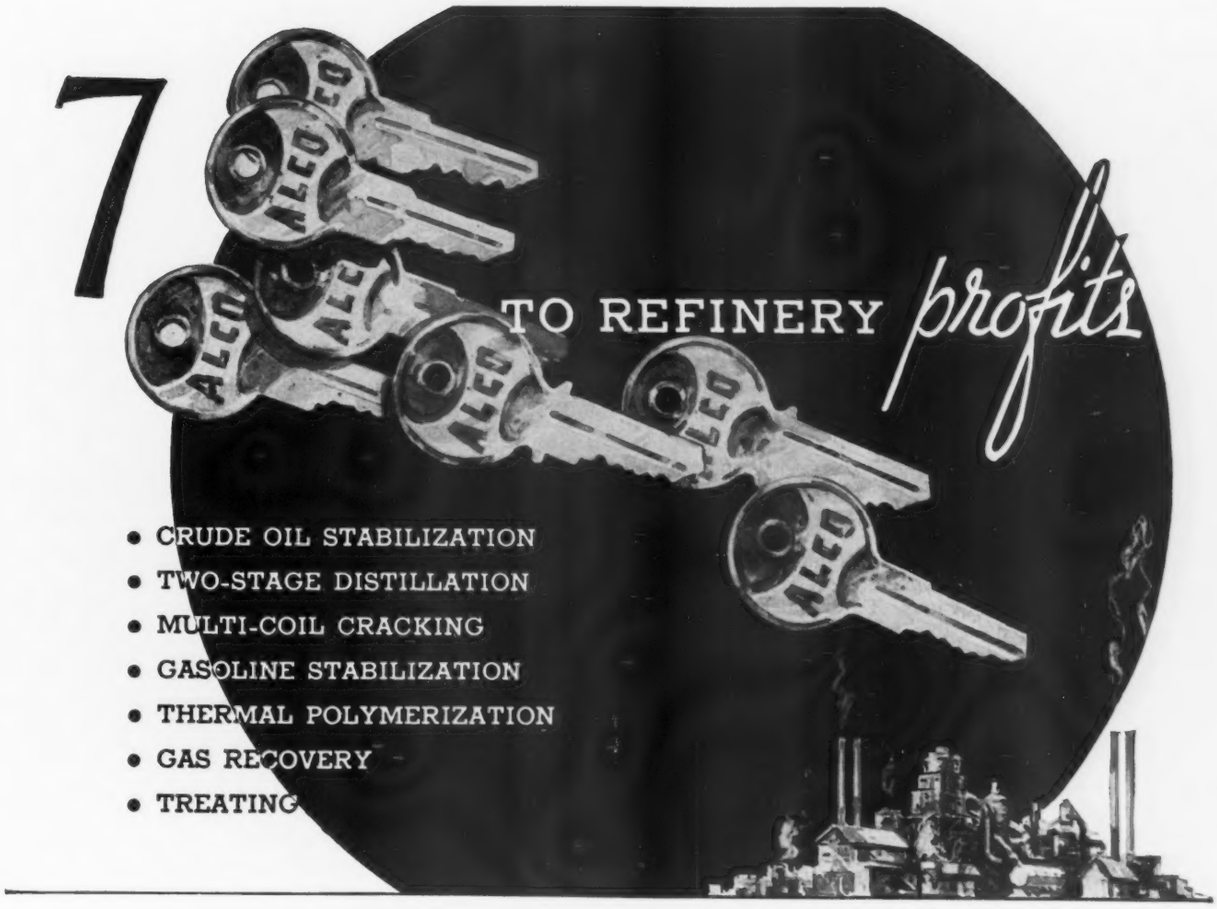
Tyndall Cone (after Bary).

Fig. 3. The Tyndall cone, showing how light is affected when passing through a colloidal solution

To the average layman, when the word colloid is mentioned, several questions will immediately come to mind. In the first place just what is a colloid? How does it work? Why does it work in some instances to a greater advantage than in others? Do all colloids possess the same advantage? Are colloids a cure-all for all water conditioning problems? Are there different types of colloids and if so, do they all possess the same properties? These and many other questions relating to the field of water conditioning must be answered. While I appreciate that you will undoubtedly have many questions that I will not have time to dwell upon, or that I will even probably not think about, it is my hope that by a simple and concise explanation of the chemical and physical phenomena involved, to enable you to better understand the basic principles of colloidal chemistry and its application to water conditioning problems.

To begin with, colloids are in reality a state of matter and not an individual substance. Many chemicals can be placed in the colloidal state, and by no stretch of the imagination can one assume that simply because a substance is of a colloidal nature, that it is suitable for water purification. Soaps, glues and many other substances are common illustrations of true colloids. Many metals can be placed in the colloidal state and yet are unfitted and have no value in this field.

To understand this better, it will be necessary for us to return momentarily to elementary chemistry and the study of true solutions. If we take a pinch of common table salt, chemically known as sodium chloride and drop it in a glass of water and stir for a moment, the salt entirely disappears from view. The sodium chloride has ionized and the salt has gone into a true solution. If we were to place two electrodes in this solution, one charged positively and the other charged negatively and pass an electric current through the solution, we would find that the salt, sodium chloride, has broken into its two component parts. Sodium, which carries a positive charge will migrate to the negative pole and chlorine which carries a nega-



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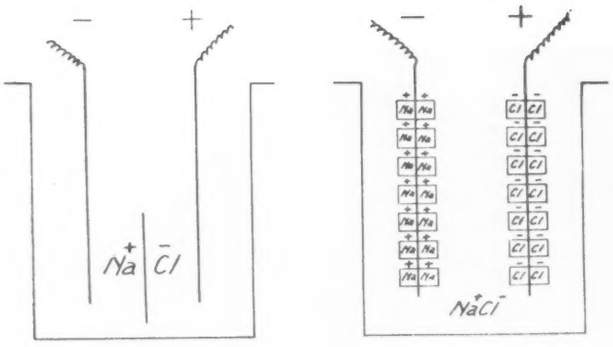
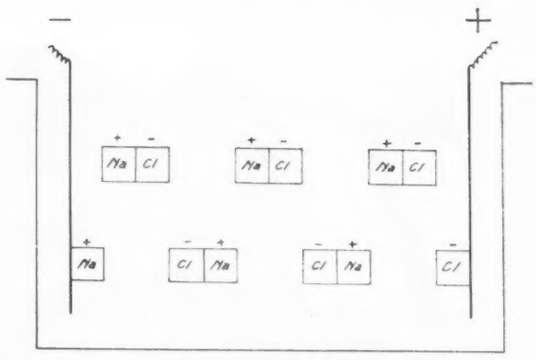


Ionization of Sodium Chloride

Fig. 1. Diagrammatic illustration of the ionization of sodium chloride in an electrolytic cell, to form negative Cl and positive Na ions



Migration of Sodium and Chloride Ions from Sodium Chloride

Fig. 2. Diagram illustrating the migration of Na and Cl ions in an electrolyzed solution

tive charge, will migrate to the anode or positive pole. Fig. 1 illustrates this phenomenon.

Ions which carry a positive charge, such as sodium in this case, are called cations and those which carry a negative charge, such as chlorine, in this illustration, are called anions. These terms were given by Faraday, an early experimenter in the subject of ions. Salts which go into true solutions, as illustrated in this example, are termed electrolytes and the term dissociation or ionization has been used to designate the separation of a substance into its ions on being dissolved.

IN Fig. 2, we have attempted to illustrate just how these ions migrate to the pole carrying a charge opposite to that which it carries.

In this, you will notice the sodium ion has split off from the chlorine ion and has attached itself to the negative pole, while the chlorine ion has attached itself to the positive pole. This leaves free sodium and chlorine ions in solution which momentarily combine, reverse their position and then migrate further towards the pole, carrying the charge opposite to which they bear.

In 1861 an experimenter by the name of Graham noticed that when he made solutions of different substances, some of these behaved quite peculiarly. This was particularly true of such substances as glues and certain types of gums. He noticed when he reflected a beam of light through a solution of the substance, the light did not pass through clearly and as distinctly as it did with other substances that ionized completely. This light, he noticed, was diffused and scattered. The diffused passage of a beam of light applied in this manner, is called a Tyndall cone and is characteristic of colloids in general.

Graham later found this phenomenon was due to the fact that the particles in solution were much larger than an ion, and that it was the great multitude of these large particles which caused a diffusion of the light. Substances which behaved in this manner, he called colloids from the French word meaning glue, and differentiated them from those substances which permitted a beam of light to pass through their solutions clearly and distinctly. This other class of substances was called crystalloids.

From this crude beginning, a great number of scientists have compiled a tremendous amount of data on the subject of colloids. Today, colloids are considered an entirely different state of matter and are differentiated from other substances on the basis of their particle size.

It has been found that when colloids are placed in solution, they do not ionize or break down into ionic particles as we have just described, but rather go into solution as a single particle or unit containing all of the substance as a whole. In this respect, they are somewhat similar to sugar and substances of a like character, but differ from these substances in that they do not break down into a single molecule, but usually a combination of several molecules. Colloids are in reality giant molecules and hence many times larger than an ion.

From the foregoing, we can readily see that lying between the states of matter known as true solutions and suspensions, there is another state of matter. This is known as the colloidal state. There are fairly clear lines of demarcation between true solution, colloids and suspensions, and these lines of demarcation or classification are based on the particle size of the various substances. Table 1 will serve to illustrate these divisions.

TABLE 1
Classification of colloids, which are intermediate in particle size between true solutions, and suspensions

True Solutions	$1m\mu$	Colloids	1μ	Suspensions
Diffuse readily and pass through filters		Do not diffuse, but do pass through filters		Retained by filters separated by gravity
No Brownian Movement perceptible		Brownian Movement Rapid / Brownian Movement Slow		No Brownian Movement
1 millimicron 4×10^{-8} inches .00000004			1 Micron 4×10^{-5} inches .00004	

COLLOIDAL particles are so small it has been necessary to devise special units of measurement in order to reduce the cumbersome handling of large figures. In order to better understand the classification of a colloid, we should first understand these units of measurement. The unit of length commonly used in measuring a colloid, is the micron. This is one one-thousandth of a millimeter or four one-hundred-thousandths of an inch. A smaller unit of length is used and known as a millimicron, which is one one-thousandth of a micron and is equivalent to four one-hundred-millionth of an inch.

Referring now to the illustration. To the extreme left, we have true solutions; those substances which diffuse readily and which will pass through the finest filters. These substances do not exhibit Brownian movement, a peculiar phenomenon limited to the colloidal state of matter which we will explain in detail later. The largest size of the particles falling in this class, is one millimicron.

On the extreme right we have suspensions, those substances which are retained by filters and which can be separated by gravity through settling. You will notice no Brownian movement is perceptible in this state of matter, thus resembling true solutions in this feature. The smallest particle size in this class is one micron. In between these two states of matter, we find true colloids, the upper limitation of particle size being one micron and the lower limitation being one millimicron. These substances when placed into solution, will pass through the finest filter papers, but they will not diffuse or ionize in the manner described earlier. While I have made the statement that there are clear lines of demarcation between these various states of matter, I wish it to be distinctly understood that the limits of measurement may vary slightly.

I have mentioned that Brownian movement is a phe-

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nomeon exhibited only by colloidal particles. A word of explanation on this interesting peculiarity should not be remiss at this time.

In 1828 an English botanist by the name of Brown was studying some grains of pollen under the microscope, when he noticed that many of them moved about in the liquid. At first, he was under the impression that life was the cause of this motion. Conducting further experiments with clay, he procured a similar motion and thus proved that life was not the actual cause. This led to the belief that Brown was actually watching the movement of active molecules. This supposition was proven to be erroneous also, and the present day explanation of this phenomenon is that the motion of the particles is caused by the bombardment of the molecules of the liquid upon the colloidal particle. This is the action that is called Brownian movement.

TABLE 3

Decimal subdivision of a cube, showing the comparative and actual increase in exposed surface

Length of edge.	Number of cubes.	Total surface.
1 cm. = 0.3937 in.	1	6 sq. cm. = 0.93 sq. in.
1 mm. = 0.0394 in.	1,000	60 sq. cm. = 9.3 sq. in.
0.1 mm. = 0.0039 in.	1,000,000	600 sq. cm. = 93 sq. in.
0.01 mm. = 0.0004 in.	1,000,000,000	6000 sq. cm. = 6.46 sq. ft.
1 *u* = 0.001 mm.	1,000,000,000,000	6 sq. m. = 64.58 sq. ft.
0.1 *u* = 0.0001 mm.	1,000,000,000,000,000	60 sq. m. = 645.83 sq. ft.
0.01 *u* = 0.00001 mm.	1,000,000,000,000,000,000	600 sq. m. = 6458.33 sq. ft.
1 *mu* = 0.001 *u*	1,000,000,000,000,000,000,000	6000 sq. m. = 1.48 acres
0.1 *mu* = 0.0001 *u*	1,000,000,000,000,000,000,000,000	6 hectares = 14.83 acres
0.01 *mu* = $\frac{4}{10,000,000,000}$ in	1,000,000,000,000,000,000,000,000,000	60 hectares = 148.26 acres
* 0.001 *mu* = $\frac{4}{100,000,000,000}$ in.	1,000,000,000,000,000,000,000,000,000,000	6 sq. kilometers = 1482.6 acres = 2⅓ sq. miles

*These subatomic dimensions are 1000 times larger than the theoretical size of electrons

$1\ u = \frac{1}{1.000}$ mm.; $1\ mu = \frac{1}{1.000}\ u$.

If this hypothesis is correct, then the smaller the particle the more rapid the motion and this is exactly what occurs, as proven by ultramicroscopic examination.

We can therefore see that if a particle of colloidal size is kept continuously in motion by bombardment of molecules, it will thus be materially retarded from settling; and the smaller the particle, the more rapid the motion and the longer time will be required for settling. From Stokes law, the rate of settling for a spherical particle of quartz of colloidal size has been calculated and it has been found that such a particle will settle one foot in 63 years. We can therefore safely state that sufficiently finely divided particles will be kept in suspension in the liquid indefinitely by the Brownian movement, provided agglomeration of several of the smaller particles to form a larger particle is prevented. Such a colloidal solution is called a sol.

In the foregoing classification of a colloid, we can thus see that before we can reach the colloidal state, we must have our material in a very finely divided condition. In true solutions, we must dissolve one substance in a certain medium, for example salt dissolved in water. In the case of a suspension, we must have a particle floating about in another medium, for example—silt or mud, suspended in water. This same condition holds true in the colloidal state of matter. In other words, we must have something dispersed in some other substance before we can attain the colloidal state of matter. These are called phases. The internal phase being the substance dispersed and the external phase the dispersing medium.

Inasmuch as all matter exists in three different forms—gases, solids and liquids, there are nine possible combinations or nine different classes of colloids which we could prepare from these three different forms of matter. However, all gases known to man will mix together in any proportion and it is therefore impossible to have a gas dispersed in another gas. Table 2 will explain the different types of colloids which are known and gives illustrations of each example.

TABLE 2

Illustrating different types of colloids and some common illustrations of each

Dispersed Phase	Dispersion Medium	Illustrations
Gas ..... in	Liquid	Foam, whipped cream, lather.
Gas ..... in	Solid	Meerschaum, lava.
Liquid ..... in	Gas	Mist, fog, clouds.
Liquid ..... in	Liquid	Milk, mayonnaise.
Liquid ..... in	Solid	Cosmetics, creams, shoe polish.
Solid ..... in	Gas	Smoke, dust.
Solid ..... in	Liquid	Gelatin and metals in water.
Solid ..... in	Solid	Some alloys; gold in ruby glass.

The question now arises—How can we approach this colloidal state of matter? How do we make a colloid? This can be achieved in either of two manners. The first method is to take a large piece of material and break it down continuously and to sub-divide it until its particle size falls within the colloidal range. This method simply resolves itself into a reduction of particle size; a reduction of one large particle into a great many smaller particles. The second method is to start with particles smaller in size than those of a colloid and to build them up into larger particles, until they reach the colloidal size. In this instance, we simply build a tiny particle up to the size of the giant molecule. There are several different known methods of going from the larger size particle of suspension, to the smaller particle size of a colloid, chief among which is grinding through an apparatus known as a colloid mill, and by mixing with the particle, another substance that will prevent the resulting particles adhering together, to form larger ones again. This treatment is known as peptization.

THE other method of preparing a colloidal dispersion by building up the particle size of the true solution, can be illustrated by mixing together, a solution of a calcium salt and alcohol. The calcium salt is a true solution but has a lesser solubility in alcohol. In adding to the alcohol, which is the dispersing medium, the molecules of calcium gradually become insoluble and several of them coalesce or agglomerate, forming a giant molecule. The formation of a great number of these molecules, causes a swelling action with the resulting formation of a gel,—as illustrated.

Another very important phase of colloid chemistry, is that it is really a chemistry of surfaces. Each time we sub-divide a particle, we bring into existence another surface. If a cube, one centimeter in size were evenly divided into cubes one millimicron on each side, the surface exposed would increase from 6 square centimeters to 1.48 acres. Table 3, showing the progressive subdivisions of a cube, will illustrate this point very vividly.

With such a large increase in surface, we can procure reactions in colloidal chemistry that are vastly different from those of crystalloid chemistry. Many reactions are thus speeded up and the one outstanding phenomenon resulting from the introduction of this great surface, is that our reactions do not proceed on a stoichiometric basis. Thus, it is possible to accomplish a more complete and a more thorough reaction with lesser material and in lesser time. In our colloidal dispersions, we are dealing with particles of very small size and we have therefore increased the interfacial surface between the colloidal particle and its dispersing medium to a very great extent. It is this inter-facial

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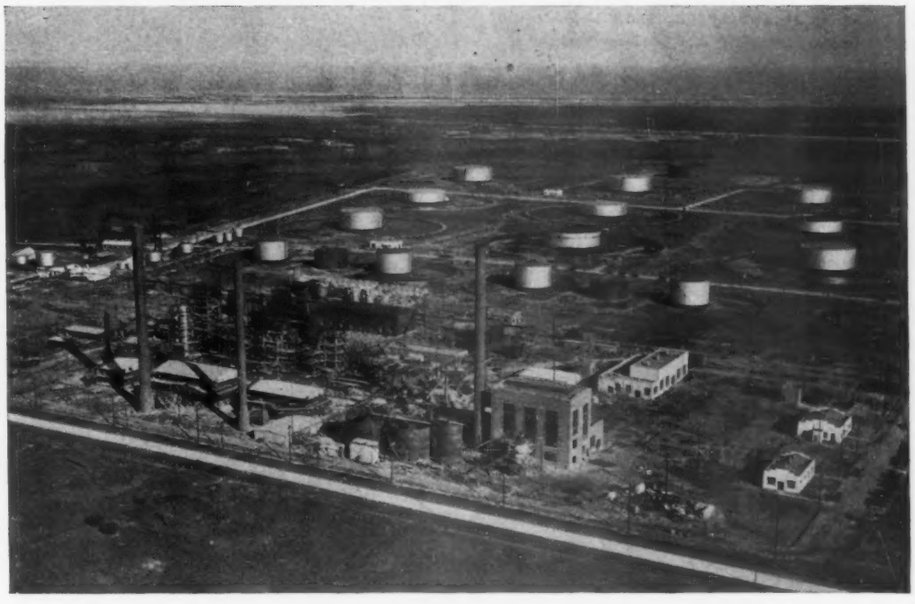

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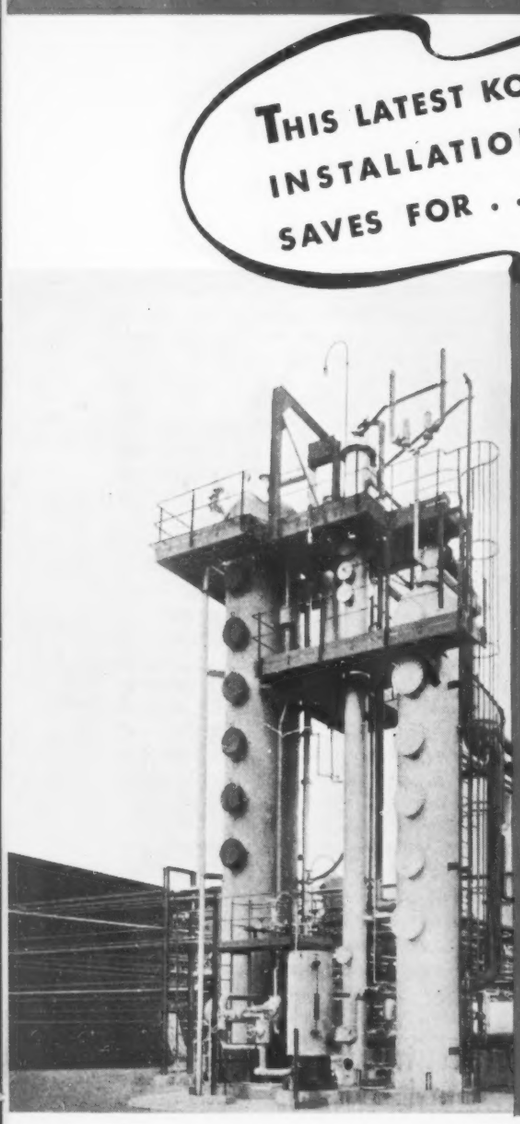

(Right) A view of The Atlantic Refining Company purification installation, showing the pumps, circulating tank, cooler, heat exchangers and towers. The simplicity and compactness of the Koppers plant is shown by the picture.

(Left) A close-up of the towers in the Koppers Plant at The Atlantic Refining Company. The right, and central towers are absorbers, handling two streams of gas. The left tower is the common actifier.

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Koppers 1-Stage Phenolate Process is covered by U. S. Patents Nos. 2,002,357; 2,028,124; 2,028,125

Koppers 2-Stage Phenolate Process is covered by U. S. Patent No. 1,971,798

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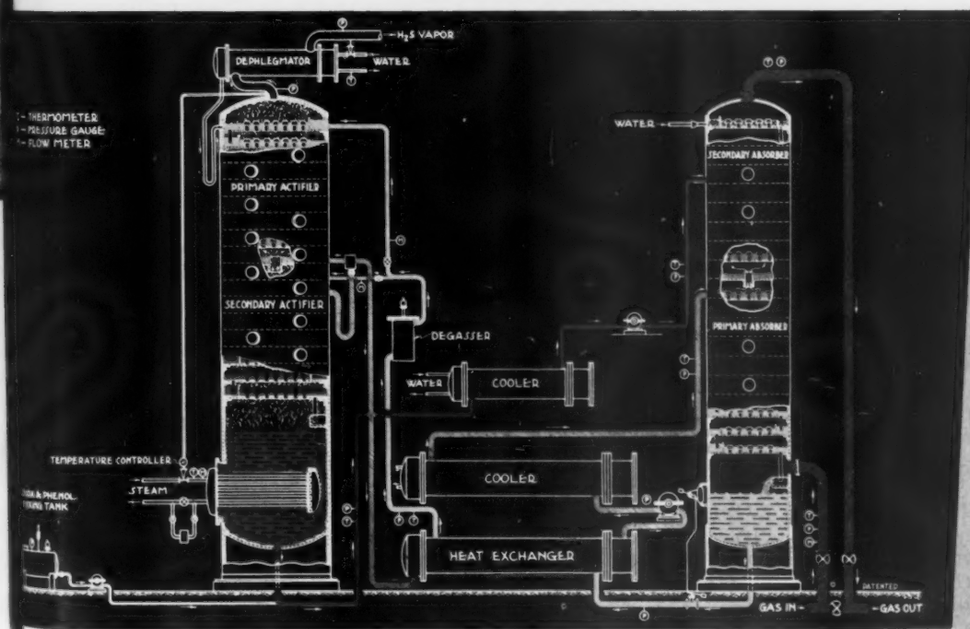

This diagrammatic view shows the cycle of operation of the Koppers Two-stage Purification Process.

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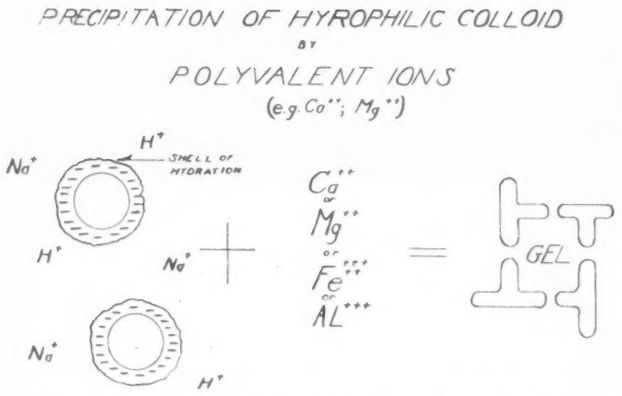


Fig. 4. Diagrammatic illustration of the precipitation of a hydrophilic colloid to form a gel

surface which gives us many of the properties of colloids that are not exhibited in any other substance. It is this characteristic to which we can attribute the property of adsorption, which is purely a surface phenomenon. Adsorption is the ability of a colloidal sol or a colloidal gel to pick up and adsorb into its surface, other particles which may be in suspension.

All particles in a colloidal state, possess an electric charge. This can be proven by placing a pair of electrodes in a colloidal dispersion and passing a charge through the solution; the colloidal particles plating out on the electrode with the opposite charge to that possessed by the particle itself. The particle itself will not break down into its component parts, as in the case of ionization, but will travel to the electrode as a whole. The system of solids dispersed in water, can be further sub-divided into hydrophobic or water-hating colloids and hydrophilic or water-loving colloids. A hydrophilic colloid differs from a hydrophobic colloid, in that each particle is surrounded by a sphere of water, commonly called the shell of hydration.

IT is well to remember in speaking of electrical charges carried by colloidal particles, that such charges are a great deal more numerous than those carried by electrons. As a matter of fact, each particle carries several layers of charges, each of which is of the same sign. The total number of charges in a given volume of a colloidal dispersion, increases as the particle size decreases. This is very important, as it readily explains the increased activity of chemical reactions where colloids are involved.

Certain types of colloids have been found to possess exceptional merit in the field of water conditioning. These may briefly be classified as protective colloids and reactive colloids. Their action is vastly different and the general tendency to class all colloids used in water purification together, has led to confusion and a misunderstanding of the value of these materials in this work. A protective type of colloid, is one that does not enter into the reaction, but rather is supposed to form a protective sheath about a crystalline precipitate as it is formed. This will prevent the coalescing of several small crystals to form larger ones, or from adhering to surfaces when settling out of solution. The reactive type of colloid is one that possesses infinitely more value, in that it possesses a direct reaction and to remove from solution, various incrusting solids such as calcium and magnesium.

It is not to be implied that a straight chemical reaction can be written showing a given molecular weight of colloid reacting with a given molecular weight of calcium or magnesium, or in other words that the reaction proceeds in stoichiometric fashion. The important point is that the reaction does not proceed in a stoichiometric fashion and that the ratio is variable and for this reason, can be termed a colloidal reaction. Fig. 4 illustrates this reaction and shows how polyvalent positive ions react with the hydrophilic sol to pectize it and to transform it into a gel.

Precipitation of Hydrophilic Colloid

Starches and tannins can be classed as protective colloids and possess certain values in inhibiting crystal growth. They are both hydrophobic colloids, positively charged and will not react with any polyvalent positive ion such as calcium or magnesium.

Another colloid which does possess the desired property of reacting with these polyvalent ions, and which we have very successfully applied to our work, in water conditioning, is one belonging chiefly to the laminaric acid series. These colloids are hydrophilic, carry a negative charge and may be peptized to various degrees with sodium salts. The amount of peptizing agent employed, determines to a large extent the particle size of the sol. When calcium or magnesium ions, or any other polyvalent positive ions are added to a system with this sol present, a selective adsorption of the calcium and magnesium ions occurs with the removal of these ions from solution. An ion of calcium or magnesium will be removed for each two negative charges carried on the micelle and each particle is therefore capable of taking up several calcium or magnesium ions. This results in the transference of the colloid from a sol to a gel and thus the actual removal of calcium and magnesium is effected in an organic form, in a type of precipitate which cannot adhere or crystallize, due to the entire absence of crystalline structure. Furthermore, the gel precipitate formed, by virtue of its enormous surface, possesses the ability to remove suspended solids through the physical property of adsorption, to a very large degree.

WITH this brief summary of colloid chemistry, let us return to the questions we asked ourselves at the beginning and see what answers we can now formulate.

What is a colloid? A colloid is an extremely fine subdivision of matter which lies between the states of matter known as true solutions and suspensions. They are found to possess a particle size between one millimicron and one micron, and exhibit Brownian movement, a phenomenon confined entirely to themselves.

How do they work? Considered from the angle of water conditioning there are two distinct types of colloids, each of which work differently. The one type, known as a protective colloid, is very limited in its scope. It is supposed to envelope or sheath crystals to prevent their coalescence. The other type of colloid, which has been found to exhibit a very great value in this field, possesses a distinct reaction with polyvalent positive ions, such as calcium and magnesium, by which it is transformed into a gel,—thus removing these solids from solution.

Do all colloids possess the same advantage? Most decidedly no. Our answer to the previous question has pointed out one great advantage possessed by a reactive colloid, not to be found in a protective colloid. The degree of peptization and the character of the electrical charges carried on the surface are a few of the other features which differ greatly in various types of colloids.

Are colloids a cure-all for all water conditioning problems? Absolutely no. Reactive colloids have their advantages and have found their place in water conditioning problems, but they must not be construed as being a cure-all. Above all,—their use should be under the direction of chemists who have made a study of their application and who are in a position to intelligently recommend where they may be used to their greatest value. The oil refiner is faced with two major water problems. One of these is the problem of the conditioning for boiler purposes; the other, the problem of water conditioning for cooling. Reactive colloids have a wide and very favorable application in both these fields and can be used in a decidedly beneficial manner, in solving both problems. Their most advantageous use, however, can only be determined by a complete study of the individual problem in hand,—keeping foremost the thought that full advantage should necessarily be employed to derive the most beneficial results from a combination of all known methods of water conditioning, and by applying reactive colloids to best suit the individual condition.

"State of the Art" AS SEEN IN THE WORLD'S CURRENT TECHNICAL LITERATURE

By M. G. VAN VOORHIS

Oil Filtration Condemned

Oil components having oiliness characteristics are removed by contact with many substances. J. J. Trillat, Meeting Inst. Mech. Eng., London, Oct. 13-15, 1937.

Use of filtration for cleaning and recuperation of used oils is detrimental to oiliness characteristics, experiments indicate. Selective adsorption by metals and other bodies of certain molecules normally present in, or added to, lubricants has been shown. Two filtrations of oil through filter paper, for example, removed most of the active molecules valuable for oiliness characteristics. Wick lubrication should be rejected where oily lubrication is required. Glass wool as well as metals attract the active particles.

Results of these experiments have thrown light on the mechanism of adsorption and make is possible to measure the approximate thickness of the boundary film and, in certain cases, to bring about the selection of molecules or to measure the surface of adsorbents. The method provides a new and delicate method for defining the quality of an oil with respect to its activity or oiliness. The method is sensitive to the effect of aging, storage, and any modification which oil has undergone.

The method involves the measurement of interfacial tension between two liquids by pulling away a platinum ring placed exactly at the interface between the two liquids. The study of interfacial tension of oil and water gives useful information for the control and acceptance of lubricants. Study of the interfacial tension as a function of time shows the rate of change of tension as the adsorbed layer is formed.

The activity of an oil can be measured by employing clean calibrated metal balls. Paraffin oil activated by oleic acid is placed in contact with the balls which remove some of the molecules of oleic acid. Rate of change of surface tension of the oil on a water surface is measured before and after contact with the metal balls. The difference in results is used to calculate the number of molecules adsorbed and the thickness of the boundary layer retained on each ball. Further, the formation of the layer can be studied by varying the conditions of contact.

* * *

Cushioned Lubrication

Yieldable particles, instead of "solid-lubricant" particles such as graphite, are basis of new lubricating oil. V. A. Abrams and C. A. Hochwalt, Pat. 2,089,680.

Finely divided particles of organic matter larger than colloidal size have been applied to lubricating oils to provide a stable load-carrying capacity in excess of 30,000 pounds per square inch and up to 75,000 pounds. These particles are capable of highly viscous or plastic flow under pressure. Preferably the particles are insoluble in the vehicle and non-melting at high temperature closely approaching the decomposition point of the particles.

The conception of the lubricating action is that the particles serve as yieldable flowable cushions between the bearing surfaces and, because of their relatively high degree of viscosity, are able to withstand high compressive and shear forces and thus prevent metal to metal rubbing and seizure. The particles also possess a high resistance to flow under pressure at high temperatures.

The particles differ from the so-called "solid-lubricant" particles, such as graphite, in that they are elastic and capable of viscous or plastic flow at high temperatures so that when compressed between the bearing surfaces they spread toward each other to form a substantially continuous cushioning layer, as distinguished from the highly discontinuous layer formed by the true solids.

The lubricant differs fundamentally from known lubricants containing soap or wax particles, or the like, gelled or otherwise, since so far as is known, all such particles which have been used in lubricants will melt at moderately elevated temperatures and will not exist in particle form.

A wide variety of substances can be employed to form lubricant particles. Polymerized and/or oxidized drying and semi-drying oils, vulcanized products, hydrocarbon products, insoluble high-melting soaps, and other materials may be used. Tung, linseed, and soya bean oils can be polymerized by heat alone to the point of insolubility in mineral oil. Raw rubber, castor oil, soya bean oil, corn oil, linseed oil and tung oil can all be vulcanized, as with sulfur monochloride, to form suitable masses. Hydrocarbon products include insoluble asphalts, such as blown or oxidized asphalt and insoluble higher polymers such as oxidized resins.

Particles are of a gel nature, that is, are swelled or possess an adsorbed liquid layer. In the case of true gel particles, elasticity and resiliency is a characteristic of large gel masses which have "set." An adsorbed liquid layor or skin may also produce elastic behavior, even though the kernal is not elastic in nature, due to the tension of the outer surface of the adsorbed layer or of what may be termed the interface between the adsorbed liquid and the unadsorbed liquid which surrounds it.

Another effect is also obtained when particles having adsorbed liquid skins are so close together that a single adsorbed liquid skin surrounds several nuclei, it is believed. In this case separation of the particles is restrained, because such separation tends to increase the area of the outer surface of the adsorbed liquid, and thus tends to increase the surface energy. There is always a tendency for the body to resist increase of surface energy and to change in such a way as to decrease the surface energy. This is illustrated by the fact that a drop of liquid resists partition, and if distorted seeks to assume a form which will give it a lesser surface area. Hence, separation of the nuclei is restrained and the nuclei tend to snap back together when separated. The result is that a minimum finite force is required in order to produce continued motion.

Two Ways of Producing

There are two principal ways of producing "gelcose" particles. The first consists in preparing the material directly and subsequently grinding it in powdered form with a liquid capable of solvating or swelling it without dissolving it, and then distributing the gelcose particles in a suitable liquid vehicle, which may be the same or a different liquid.

The second method, which is preferred, is to dissolve the raw material in unthickened form in a liquid in which the thickened form is insoluble and which is capable of imparting gelcosity to particles of the thickened material.

For example 10 per cent of tung oil is dissolved in a petroleum oil, such as a light neutral oil of 28° Baume gravity, with a small amount of an oxidation catalyst preferably added, and subjected to blowing or other method of producing oxidation and agitation of the tung oil. After the oxidation has progressed for a certain period, an insoluble oxidized tung oil product will come out of solution. Due to the agitation it will be in the form of small particles

and these particles will become solvated or swelled by the mineral oil and thus become gelcose particles.

Three steps are involved: dissolving the tung oil in a solvent, changing the state of the tung oil so that it comes out of solution, dissolving, absorbing or otherwise causing some of the original solvent to be taken up by a tung oil in its new state so as to form a gel, and break the gel up so as to produce a discontinuous gelatinous mass containing discrete gel particles.

All bearings, irrespective of pressure, located in high temperature regions can use this lubricant. Among the lubrication fields in which this lubricant is of especial value are the lubrication of roll-neck bearings in steel mills, thrust bearings in large turbines, dynamos, etc., and the lubrication in metal-cutting where the chips bear against the cutting tool with great pressure.

The lubrication principle is too new to be thoroughly evaluated but service tests are now under way. There has been no commercial distribution. Sulflo Corp. of America, 701 Spring St., Elizabeth, N. J., holds the patent.

* * *

Oxidation of Lubricating Oil

Metallic soaps inhibit oxidation of lubricating oil. E. A. Evans and A. L. Kelman, Meeting Inst. Mech. Eng., London, Oct. 13-15, 1937.

Experiments with metal soaps have revealed that some can inhibit the catalytic action of iron in the oxidation of lubricating oil. Laboratory tests indicated that 0.25 per cent of tin oleate gives the greatest inhibitory effect while the engine test showed it to be 0.1 per cent. For chrome oleate the respective results were 0.17 per cent and 0.8 per cent.

Most encouraging results were obtained in the engine when exploring mixtures of tin and chromium. Efforts to obtain similar criteria by laboratory methods were not so successful. Engine results indicated the correct amount of tin oleate to use is 0.1 per cent with 0.4 per cent to 0.8 per cent of chromium oleate.

Barium presented some attractive characteristics but its use was debarred by other considerations. In general, the only inhibitory metallic oleates contain tin, chromium, nickel, thallium, or titanium. The inhibitory powers of the metallic soaps were not materially affected by a change of acid radical.

* * *

Lubricating Film Strength

Lubricating oil films have different composition than oil mass. Film characteristics are determined by attraction of components to bearing surface. A. W. Burwell and J. A. Camelford, Meeting Inst. Mech. Eng., London, Oct. 13-15, 1937.

When a lubricant is at work in any system regardless of any factors which determine its efficiency, the actual composition of the oil film on the bearing surfaces is not the same as that of the oil mass. Characteristics of the lubricating film are determined by the relative attraction for bearing metals of the lubricant's components. This is true whether extraneous material has been added or not.

The degree of efficiency of substances for increasing oiliness is frequently in proportion to the polar strength of the molecule. Compounds with unattached or residual valences invariably exhibit strong attraction for metal bearing surfaces. Film strength is so closely associated with oiliness phenomena that the conclusion is inevitable that in certain phases of lubrication the two are synonymous. However, every possible range of pressures, temperatures, and other controlling factors should be explored thoroughly before logical conclusions can be drawn.

Differences in coefficients of kinetic friction have been noted in many oils of the same general physical characteristics but of different origins. In some cases these variations are of great importance. Instances of airplane engine oils have been encountered in which there was such high coefficients of kinetic friction in the range of full fluid-film lubrication that the internal friction of the films produced a gradual shearing-off on the bearing faces, resulting in failure. When tests were made on these same oils with identical bearing surfaces, but under greatly increased pressures and temperatures, very low coefficients of friction were obtained.

Study of thin film lubrication has been by comparison of coefficients of friction. Coefficient of friction-pressure relations under constant temperature conditions have been similar. Curves have consisted of two parts. As pressure increases the coefficient first decreases (full fluid-film lubrication) and then increases (thin film lubrication). During the latter state viscosity plays no part in the effective action of the lubricant and the range of pressures in which lubrication is efficient is not predictable beyond the limits of observation. Also no abrasion or metal-to-metal contact occurs.

Typical coefficient of friction temperature curves at constant pressure showed a decelerating decline of coefficient of friction. A Mid-Continent S.A.E. 30 oil suffered film rupture at about 300° F. whereas, treated with an addition agent, the lubricant continued to serve in the region of thin film lubrication, with continued decline in coefficient to at least 400° F.

The reason is proposed that the oil film becomes a plastic solid rather than a viscous liquid and that on further application of heat the melting point of this solid is reached. Further increase in temperature might, therefore, act upon viscosity to reduce the coefficient of friction.

Transition from full fluid film to adsorbed or oiliness film is normally gradual though exceptions have been noted, particularly where dopes have been used. Films may be of any density or physical condition. In addition to the full fluid film and adsorbed film regions a lubricant can function in a region in which the film is repeatedly ruptured and reformed, metal-to-metal contact and abrasion occurring without necessarily causing seizure.

Tests in which oils containing an addition agent* were contacted with 10 per cent by weight of metal powders (lead, copper, iron-by-hydrogen, and zinc) demonstrated a segregation of some of the active constituents of the lubricant at the metal surfaces. This does not mean that the attraction of these polar bodies to the metal surface gives rise necessarily to adequate film formation and protection. Other substances in the oil such as sulfur, oxygen, and nitrogen also exert modifying influences.

Pressure-coefficient of friction curves of oils so treated showed in the higher pressures higher coefficients of friction than for the compounded oil not treated. Coefficients were lower, however, than for the oil without the addition agent. In the lower pressure range below 800 pounds per square inch, oils treated with metal powders gave coefficients higher than the unmodified white oil. This is accounted for by the presence of natural oiliness characteristics and compounds such as acid esters, alcohols, alcohol-ketones, and ketones.

Temperature-coefficient of friction curves showed failure of the original oil at about 250° F. Oiliness compound produced a steady lowering of the coefficient to 250° F. and then unchanged up to 400° F. After treatment with powdered metals coefficients of friction became higher and failure occurred at lower temperatures. The experiments indicated existence of selective segregation of polar bodies to metal surfaces which influences the behavior of lubricating films.

* An ester of saturated fatty acids of high molecular weight, produced synthetically.

* * *

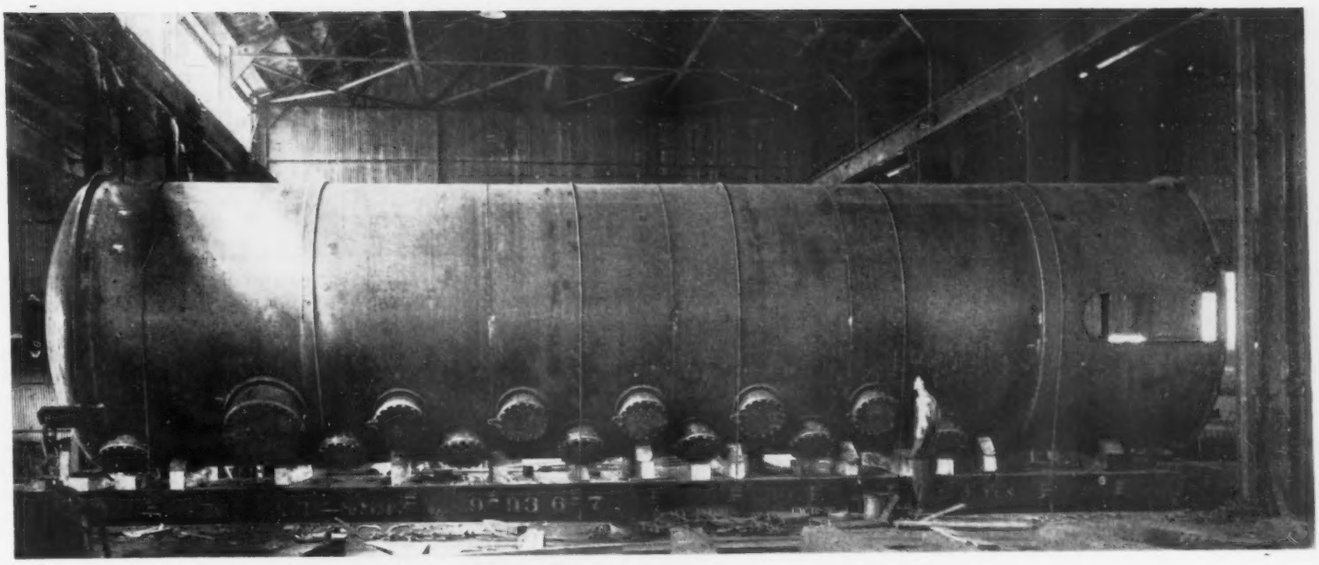
Bearing Friction Magnified

Bearing friction is a process of high frequency "stick, slip." F. P. Bowden, Meeting of Inst. Mech. Eng., London, Oct. 13-15, 1937.

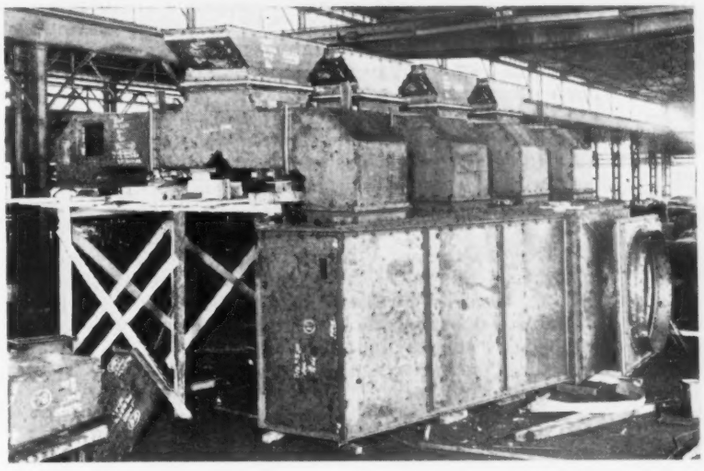
Examination of sliding, as it occurs in bearings, by an apparatus of recent construction shows the process to be one of "stick, slip." The surfaces jerk along at the rate of more than a thousand cycles of intermittent clutching and breaking away of surfaces per second, it has been shown. In this process frictional force and surface temperature both undergo violent fluctuations whether lubricated or not.

Although the general temperature never exceeds the lowest melting point of the two rubbing materials, localized

(*Continued on page R-402*)



12′ x 51′-3″ Vacuum Steam Still ⅝″ Heads — ½″ Shell



(Above)—Breeching for Tube Type Heater

(Right) — Berquist Bins for Carbon Black Plant

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Engine Operating Conditions Of Today Termed Challenge to Laboratory Testing

THE value of meetings and discussions of methods of testing and inspection of refinery products must be measured in terms of the overall improvement in standards of excellence of laboratory results, rather than in terms of specific details of information gleaned by individual participants in these meetings.

This is the consensus of opinion of the laboratory technologists of the Division of Standards and Tests, National Petroleum Assn., as expressed at its semi-annual meeting at Reno, Pa. recently. The principle of greatest importance in improving the dependability and reproducibility of test results is to follow exactly the standard procedure of the official test methods used, speakers emphasized.

Many European technologists are more individualistic in their attitudes than those in America, several laboratory directors have found, and enter with reluctance into co-operative work looking toward the development of mutually acknowledged and used standard methods.

This is not generally true with British technologists, it was pointed out, with whom several tests have been and are being developed jointly with technologists in this country, the tests being practically identical in Britain and America.

Engines Get Harder Wear

European automobile engines are operated at more nearly maximum output for a much greater percentage of the time than in this country, J. C. Geniesse of Atlantic Refining Co., stated in reviewing the situation in Europe as he found it during a tour in the summer of 1937. For this reason they "wear in" sooner, and wear faster with an insufficient oil supply.

A great deal of work is being done in Europe on testing methods for determining the oxidation resistance, oiliness, film strength, stability and carbon deposition of lubricating oils. For some of these tests, especially oxidation and stability tests, extremely severe temperature conditions are proposed, temperatures of 570° F. to 750° F. being used by some investigators, it was reported.

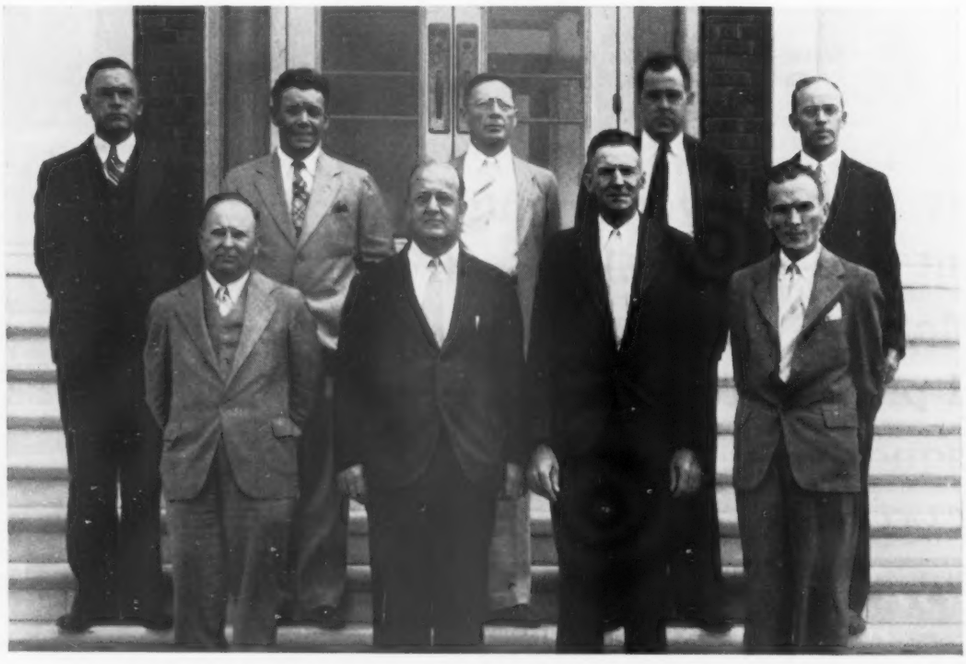
Any property of an oil or any operating conditions which increase the temperature of a bearing shortens the bearing life and is therefore undesirable, the British technologists have found, Geniesse reports. Since use of a lighter oil reduces the crankpin and bearing temperatures in comparison with the use of higher viscosity oils, they have decided against the use of heavy oils for that reason especially, he found by discussion of the subject with several researchers abroad.

Exhaustive tests on bearing wear in European laboratories have shown rather conclusively, Geniesse was told there, that no appreciable difference in wear is found when using oils of different viscosities, at elevated and normally high operating temperatures. On a cold engine, however, operating at 120° F. jacket and lower, the wear on a bearing with a 10-W oil was found to be as much as 18 times that when using SAE 40 oils, he was informed. In the engine itself the wear shown by oils of 10-W to 40 grades did not vary appreciably between grades, the British technologists have found.

Nitrogen Accelerates Oxidation

The presence of nitrogen oxides in or in contact with lubricating oils accelerates the oxidation of the oil, at 420° F., Geniesse was told in Europe. Oleates of tin, aluminum, and some other metals retard the deposition of carbon and such cylinder deposits, especially when leaded fuels are used. For temperatures up to 400° F. the rate of oxidation doubles for each 20° F. temperature increase, they find above 400° F. the rate decreases, doubling for each 40° F. temperature increase.

A four-ball apparatus for testing oiliness and extreme pressure characteristics of lubricants has been developed



Part of the technical staff of the U. S. Bureau of Mines Petroleum Experiment Station, Bartlesville, Okla. Front row, left to right—Ludwig Schmidt, senior petroleum engineer; N. A. C. Smith, supervising engineer, Bartlesville station; E. J. Dewees, associate petroleum engineer; W. B. Burwald, senior petroleum engineer. Back row, left to right—R. E. Heithecker, petroleum engineer; Boyd Guthrie, associate petroleum chemist; J. W. Horne, associate petroleum chemist; D. B. Taliaferro, associate petroleum engineer; H. M. Smith petroleum chemist

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Dr. Vladimir N. Ipatieff, director of chemical research, Universal Oil Products Co., who was honored recently at a banquet by the Chicago Section of the American Chemical Society, on the occasion of his 70th birthday anniversary. Dr. Ipatieff is an internationally known authority on catalysis, and the use of catalysts in petroleum research. He developed the catalytic process for polymerization of petroleum still gases to produce motor fuel, now in wide use by refiners. He urges the revision of chemical textbooks and teaching, in the light of modern scientific concepts.

Compression ratios, it was pointed out by Thompson, have been only slightly increased over last year, with the average ratio in 1937 being 6.27 to 1, and 6.30 to 1 in 1938. Decreases in compression ratios have been made on four models in 1938, it was stated.

Importance of Checking

Inter-laboratory co-operative checking of methods and results is one of the best methods for maintaining a high and uniform standard for test laboratory work, P. M. Robinson, director of research for the Pennzoil Co., Oil City, pointed out.

In the same vein, both Robinson and MacLean Houston, head of manufacturing for United Refining Co. of Warren, Pa., stressed the importance of exact and scrupulous adherence to the details of standard test procedures in obtaining correct and checkable results. Tests should be carried out in the strictest manner permissible under American Society for Testing Materials procedures, to insure correct and uniform results, these technologists stated.

Routine test methods are empirical, Robinson stated, and therefore for proper results must be followed with greatest strictness. Most errors in routine test results are traceable to three causes, he said: poor, non-standard equipment, poor reagents and slovenly operation.

Laboratories should avoid the use of special procedures, or "wrinkles" in testing except when the results are to be used purely for plant control or within the company, he said. Testers should have not too much work, to permit them to give adequate attention to tests especially at critical times in the procedures.

Tests for Conradson carbon residue, color, pour point, and API gravity are among the tests mentioned by the technologists present at the meeting as being most frequently slighted in the laboratory.

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and is in use by the Royal Dutch-Shell research organization, Geniesse reported. Three ball bearings, a half-inch in diameter, are placed in contact in a horizontal plane, fixed in position so as not to turn. A fourth ball is placed above and in point-contact with these three, the fourth being set in a chuck to turn at, normally, 1500 r.p.m. Following a standardized procedure, the upper ball is rotated for a given length of time under a certain pressure against the three stationary balls, all in contact with the lubricant being tested, and the relative lubricating efficiency of the oil is determined from the area of worn portion of the balls.

Car Lubrication Trends

Trends in lubrication and in the design of lubricating systems of 1938 cars, and new departures in lubricating details and provisions of the new models were presented in detail by John W. Thompson, of the editorial department of NATIONAL PETROLEUM NEWS during the evening session of the meeting of the Division of Standards and Tests of the N. P. A.

Increasing severity of engine operating conditions appear more as a trend or indication than as a pronounced actuality, Thompson stated. Major changes in transmissions, axles and gear shifts in new cars were detailed. Several models have adopted "automatic" gear shifting mechanisms, he pointed out, and discussed their lubrication. The number of models using hypoid rear axle gears has increased from 21 in 1937 to 31 in 1938, he stated.

Particular mention was made of the trend toward increasing crankcase oil drain periods, with the statement that these periods in many cases have been "stretched anywhere from 200 to 500 per cent."

H. H. "Harry" Power reached the chairmanship of the Department of Petroleum Engineering, University of Texas, via the road of long and varied experience in production engineering. Graduated from Washington State College in 1919, doing graduate work at University of California, he has been engaged in the field as Government oil and gas valuation engineer with the Empire companies and later became chief of the engineering division of the Gulf Oil Corp. at Tulsa. He is also national chairman of the A. P. I. Topical Committee on production technology

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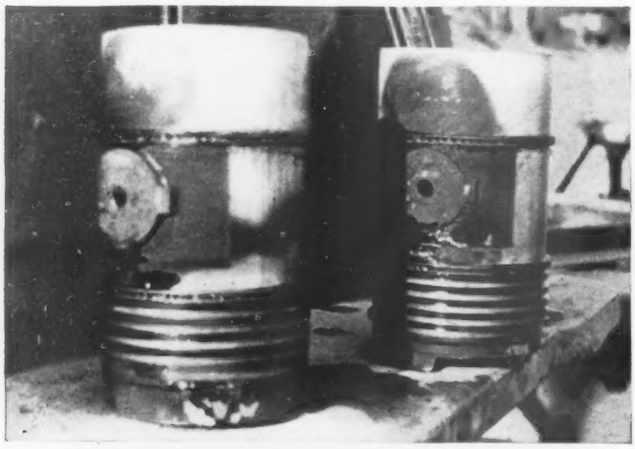

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(*Continued from page R-396*)

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* * *

Combustion Gases Promote Gumming

Nitrogen oxides formed in engine cylinder combustion hasten oxidation and gumming of lubricating oil. T. K. Hanson and A. C. Egerton, Meeting Inst. Mech. Eng., London, Oct. 13-15, 1937.

The rate of absorption of oxygen by lubricating oils at 220° C (428° F.) is greatly influenced by the presence of nitrogen peroxide in the concentrations found in the engine cylinder. As different oils behave differently in this respect, this fact must be taken into account when ascertaining the suitability of an oil.

Since the effect is to shorten the induction period, the presence of nitrogen peroxide may help to explain the rapid deterioration of the oil when gumming starts. It also explains the increased tendency to gum when knocking occurs and indicates why engine tests on oils give very different results under different conditions. It further explains why the results do not always accord with the oxidation characteristics of the oil obtained in tests where no account is taken of the catalytic effect of nitrogen oxides.

* * *

Lubrication Advances Discussed at London

A comprehensive survey of advances in lubrication in all fields was prepared for and presented at the fall meeting of the Institution of Mechanical Engineers in London. Consisting of 132 papers prepared by as many or more authorities, the material is divided in four parts. Group I (Book 1) deals with Journal and Thrust Bearings, Group II with Engine Lubrication, Group III with Industrial Applications, and Group IV with Properties and Testing.

The problems dealt with are of varied interest and the papers are relatively short. Papers on bearings range in subject matter from the performance of oil rings to the design of pivoted pad bearings and from hydrodynamic lubrication theory to lubrication of rubber bearings. Under engine lubrication is included problems of several types of engine—automotive, marine, airplane, and locomotive. The industrial applications concern specialized problems and include cutting fluids, gear lubrication, wire drawing, and chains as well as bearing lubrication.

Under properties and testing are some of the interesting discoveries and observations made in laboratory experiments with lubricants. The puzzle of oiliness characteristics is given considerable attention and technologists are gradually prying out the secrets of what gives film strength to lubricants. Instruments have been devised for determining the rate of formation of films, for examining bearing surface changes more closely, and studying the difference in friction coefficients under various conditions. Several reports on these investigations are included in Group IV. Abstracts of a few are given under the head of State of the Art, in the Refining Technology Section of N. P. N.

Each group of papers is bound separately with a paper binding. Price placed upon advance copies for each group by the Institution of Mechanical Engineers, Storey's Gate, St. James Park, London, SW1, is 2s. 6d. (about 63 cents) or 10s. ($2.50) for the set of four. The material includes a total of 950 pages (5½ x 8½ inches).

Improved Drilling Mud May Aid Production

Low-pressure oil and gas-bearing strata have been overlooked frequently in fields where rotary drilling has been employed and a thick mud drilling fluid circulated, it is believed. The mud plasters and seals the stratum as the tools pass through. Many prolific oil sands are believed to be yielding only a small part of their oil for this reason also.

A material consisting of $\frac{1}{16}$-inch diameter strips of crude rubber $\frac{1}{2}$-inch long is now recommended to be added to the mud in the proportion of five to ten per cent of the dry clay and rubber. The recommendation is on the basis of laboratory experiments in which mud sheaths were broken up by this material. The practicability of circulating a mud so treated has not been demonstrated but experienced drillers foresee no insurmountable difficulties in the development of a new technique.

The recommendation is made by C. P. Bowie in the latest published report of investigation of the Bureau of Mines (R. I. 3354). The title is Hardening of Mud Sheaths in Contact with Oil, and a Suggested Method for Minimizing Their Sealing Effect in Oil Wells.

Corrosion Testing

Symposium on Corrosion Testing Procedure has been put in book form by the American Society for Testing Materials. A volume of 131 pages, it includes seven technical papers by 12 authorities presented at the 1937 regional and annual meetings of the society. Almost one-fourth of the book is devoted to discussion.

Copies can be obtained from A.S.T.M. Headquarters, 260 S. Broad St., Philadelphia, at $1.25 in paper cover; $1.50 in cloth.

Vice Chairman of Standards Council

Dr. R. P. Anderson, secretary of the division of refining, American Petroleum Institute, has been elected vice chairman of the standards council of the American Standard Assn. The election took place at the recent annual meeting in New York. He succeeds C. E. Pettibone, American Mutual Liability Insurance Co., who served last year.

Other officers were re-elected: Dana D. Barnum, president, E. A. Prentis, vice president, and F. M. Farmer, standards council chairman.

The association reports the largest increase in membership since its formation 19 years ago. Sixteen national groups have affiliated. Among the member bodies are the A.P.I., American Society for Testing Materials, American Gas Assn., Society of Automotive Engineers and many others. Among the new members are the Automobile Manufacturers Assn., Hydraulic Institute and Heat Exchange Institute.

CCl_4 Freezing Point Misleading

Fairer comparison between carbon dioxide and carbon tetrachloride as fire extinguisher fluids is suggested than is indicated by a freezing point of —10° F. given for the latter in a recent article on the use of carbon dioxide as a fire extinguishing agent by M. G. Van Voorhis (see page 294, Dec. 3). C. B. White, chemist engineer, American-LaFrance-Foamite Corp., calls attention to the addition of other polychlorinated hydrocarbons to carbon tetrachloride which reduce the freezing point of commercial fluids to —50° F.

Norton McKean has been elected vice-president of American Meter Co., New York. First associated with the company in 1919 as superintendent of its Boston plant, he later became general superintendent and manager at the D. McDonald & Co. Works, the company's Albany plant. He will continue in those executive duties.

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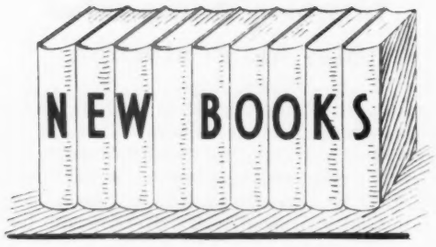

The Manufacture and Use Of Lubricating Greases

Specifically written to present concise solutions to lubricating problems met by refinery executives, bearing manufacturers, lubricating engineers, lubricating grease salesmen, research chemists, and students, "Lubricating Greases: Their Manufacture and Uses," by E. N. Klemgard, brings up to date information on manufacturing procedure, economies in production, new methods of testing and the quality of raw materials.

The book includes the chemical analysis of many commercial lubricants, abstracts of important patents, formulas, and practical processes for the manufacture of greases. Included are service test data for greases made with one or more of the fatty acid salts of calcium, sodium, aluminum, lead, and zinc, with or without the addition of solid lubricants such as graphite, asbestos, powdered metals and other materials for improving film strength, imparting "extreme pressure" characteristics, or affecting cohesion or adhesion.

The requirements of suitable greases for anti-friction ball and roller bearings have been given extensive treatment. The practical requirements of satisfactory lubricants for automotive hypoid gears, airplane engine rocker arms, pneumatic tools, wheel bearings, steering gears, railroads, mills, valves, pumps and engines are only a few of the applications covered at length. Working formulas, process details, and cost data are given for all these special lubricants as well as many kinds of more normal cup and fiber greases.

An interesting chapter deals with the colloidal nature of greases. In this chapter the application of the mass action theory to grease manufacture is given; also discussions of the correlation between such factors as worked and unworked penetration, water and soap contents, yield of grease and soap solubility factor, and the mechanism of grease lubrication. Comments on catalysis and the use of new organic synthetics, such as polymerized iso-butylene and oxidized hydrocarbons, all contribute to the book's interest and value.

Balancing these theoretical and fundamental factors are studies of grease applications, and ample space is devoted to practical considerations. Divisions are included in the book dealing with stability in storage and use, retentivity, consistency over wide temperature ranges and its importance from the standpoint of application, rate of wear, film strength, and recommendations of greases for all manner of industrial, automotive, aviation and marine uses. Specifications, formulas, and requirements of greases used in Europe and Asia are included to broaden the scope of interest to the reader.

Lubricating Greases: Their Manufacture and Use is an entirely new book, not to be considered a second edition of Klemgard's "Lubricating Greases" published 10 years ago. The present book contains 872 pages of text and illustrations. It is available from the Book Department of NATIONAL PETROLEUM NEWS at $15.

* * *

Petroleum Technology in 1936

In all industries a book summarizing recent developments in an orderly and comprehensive manner is of the greatest value to the technologist. Such is the aim of the Institution of Petroleum Technologists, London, in publishing Petroleum Technology in 1936 recently. Not only reviews but extensive references (over 2200) are made to original literature on various subjects.

A survey of all sections of the industry—geology, pros-

pecting, drilling, transportation, refining, cracking, testing and utilization—is presented. Lengthy chapters on coal and shale carbonization, hydrogenation, and engines are also included. Transportation, including separate treatment of ocean tankers, and storage are new additions to the book.

The book is larger than the first of this series, published for 1935, by some 60 pages. Each subject has been prepared by individuals who are recognized by the Institution as authorities and whose work has been specialized along that particular line. Some new names have been added to or substituted in the new reviews.

The subjects of refining, cracking, chemistry of petroleum, and carbonization of oil-yielding materials have been given somewhat more space than most of the other phases of the industry and perhaps even more detailed and painstaking cataloging the divisions of these subjects themselves. The division on cracking is a part of Universal Oil Products Co. Booklet 206, in which Dr. Gustav Egloff took a leading part. G. R. Nixon took up the numerous phases of refining, such as desulfurization of gas in relation to polymerization, crude treatment, and methods relating to important products. Particular attention is given to lubricating oil refining. B. C. Allibone reported the chemistry developments in a similar fashion.

The several low temperature carbonization methods of producing hydrocarbons from coal in Great Britain are discussed by W. H. Cadman with economic considerations going back to 1932. The shale industries are considered from the standpoint of qualities and methods of oil extraction.

Petroleum Technology in 1936 is a book of 326 pages, clothbound. F. H. Garner is general editor. The book is available from the Institution of Petroleum Technologists, Aldine House, Bedford St., London W. C. 2 for 8 shillings postpaid (about $2).

* * *

Southeastern Illinois

Report of Investigations No. 45, by the Illinois Geological Survey, Urbana, Ill., is another contribution by this diligent institution on the state's geology. This one is "Stratigraphic Studies of Pennsylvanian Cutcrops in Part of Southeastern Illinois," by William A. Newton and J. Marvin Weller.

The investigation grew out of the oil activity in this part of the state. "The purpose of this report," the authors say, "is to describe and correlate those formations that crop out at the surface, thus providing a basis for structural studies which may assist in the exploration for oil and gas. It does not include a discussion of geologic history nor of structure, detailed studies of which have not as yet been made in this area."

* * *

An Index to Geology

At few times in the history of the petroleum industry has there been greater demand for information concerning fields and prospective fields than at this time.

Beginning in 1917 the American Assn. of Petroleum Geologists has published voluminously on the technical and economic aspects of oil and gas fields. Besides its monthly Bulletin, it has issued several large volumes.

Now, it has published a "Comprehensive Index" to all its publications including the Bulletin. Daisy Winifred Heath, the compiler, has arranged in exhaustive cross-reference form subjects, titles and authors of all articles, papers and other contributions to the literature of petroleum geology that have appeared under the auspices of the association.

The Index contains 382 pages. It is being distributed free to members and associates, is sold for $3 to non-members. The association offices are in the Wright Building, Tulsa.

CURE FOR REFINING COLIC

HERE is the surest, most economical way to stabilize cracked gasoline. Du Pont Gasoline Antioxidants prevent gum formation, and discoloration. They help conserve anti-knock value—often eliminate the need for redistillation. And they cut maintenance costs by preventing exposure of your valuable equipment to the corrosive action of strong acids.

With Du Pont Gasoline Antioxidants, refiners can produce gasoline of high octane rating at lower cost. Many are now enjoying increased profits from higher yields since adopting this modern money-saving method. Write for detailed information. E. I. du Pont de Nemours & Co., Inc., Organic Chemicals Department, Wilmington, Delaware.

DU PONT
REG. U. S. PAT. OFF.

GASOLINE ANTIOXIDANTS

Patent Literature OF TODAY

Acid sludge products. No. 2 092 200, *issued Sept.* 7, 1937; *filed June* 30, 1932; *W. H. Bahlke, assignor to Standard Oil Co.; 2 drawings; 2 claims.*

Decomposition of acid sludge is accomplished by introduction into the upper part of a stripping zone at not over 200° F. and passing downwardly in counter-current to the upward flow of hot gases from a cracking zone so that the material is gradually heated to at least 700° F. and freed from water and corrosive acid substances.

The material is then passed to the cracking zone. A hydrocarbon oil is separately heated to a higher temperature and passed also to the cracking zone to maintain cracking temperature and convert the materials into light hydrocarbons of the gasoline boiling range and cracked residues, the heated oil and products of the cracking reaction forming the hot gases used in the stripping zone. Cracked residues from the lower part of the cracking zone are withdrawn from the lower part of the cracking zone and gasoline separately recovered, hydrocarbons heavier than gasoline and gases including sulfur dioxide from products leaving the upper end of the stripping zone.

* * *

Lubricating Oil. No. 2 094 593, *issued Oct.* 5, 1937; *filed Oct.* 24, 1936; *E. W. Gardiner, J. W. Greene, and A. L. Lyman, assignors to Standard Oil Co. of Cal.; no drawings;* 9 *claims.*

High viscosity index oil is produced by chlorinating straight chain paraffin hydrocarbons to a chlorine content of 10-25%, on a hydrocarbon-free basis, and dechlorinating the chlorinated hydrocarbons in the presence of silica gel.

The process comprises passing chlorine gas into a mixture of paraffin waxes at 110-250° F. and cooling below crystallization temperature of the unchlorinated paraffin wax hydrocarbons which are then separated. The chlorparaffins are heated above 300° F. with silica gel to dechlorinate them without substantial polymerization.

* * *

Solvent extraction. No. 2 094 802, *issued Oct.* 5, 1937; *filed April* 26, 1934; *W. B. McCluer and M. R. Fenske, assignors to Pennsylvania Petroleum Research Corp.;* 3 *charts;* 7 *claims.*

Pennsylvania grade residuum oil is treated with paraldehyde to improve gravity index, color and/or Conradson carbon. Components which are largely responsible for a relatively high viscosity change with temperature, for a relatively dark color and/or for a relatively high Conradson carbon residue are more soluble than other components. The solvent exhibits a selective solvent power for oxidizable components and for other substances which might result in sludge. Contact is effected by any desired means and two immiscible solutions will be formed.

* * *

Cracking. No. 2 094 980, *issued Oct.* 5, 1937; *filed Oct.* 28, 1935; *D. M. Evans, assignor to Petroleum Conversion Corp.; one drawing;* 6 *claims.*

Oils are cracked by hot gases from the exhaust of an internal combustion engine. Energy produced by the engine is used to compress the uncondensed portion of the mixture of products in order to propel them through the system and to facilitate condensation of the vapors remaining uncondensed. Oil to be cracked is preferably vaporized and mingled with the hot gases from the exhaust. The mixture of products is progressively dephlegmated to yield the desired product, leaving a stream of gas which is more or less saturated with light vapors. The latter are recovered preferably by use of the absorber and used as fuel for the engine.

Gum formation. No. 2 095 211, *issued Oct.* 5, 1937; *filed Nov.* 6, 1930; *L. P. Chebotar, assignor to The Texas Co.; no drawing;* 12 *claims.*

To cracked gasoline normally tending to deteriorate and form gums on storage is added 0.002 to 0.5% of an indophenol dye such as indoaniline, phenol indophenol, or naphthol indophenol.

* * *

Flash distillation. No. 2 095 418, *issued Oct.* 5, 1937 *filed April* 19, 1934; *E. B. McConnell, assignor to the Standard Oil Co. of Ohio; one drawing;* 6 *claims.*

In the distillation of petroleum liquid gathering on the fractionating column plate adjacent the point of feed-in to the tower is usually allowed to flow down into the liquid at the bottom of the tower, and be drawn off as one of the regular side streams. Material on this plate has been found to contain constituents which should not properly go into the first side stream and other constituents which should not go into the bottoms. The mixture is due to mechanical entrainment.

Proper separation is accomplished by providing means to return the liquid from the lowermost plate to the intake of the fractionating column, either anterior to the heating coil or at a point between the heating coil and the tower, or both.

* * *

Purging contact masses. No. 2 095 264-5, *issued Oct.* 12, 1937; *filed April* 8, 1936 *and May* 27, 1935 *respectively; A. E. Pew and J. H. Pew respectively, assignors to Houdry Process Corp.;* 2 *drawings each;* 8 *and* 9 *claims respectively.*

A high vacuum is applied simultaneously at many points within and throughout a contact mass as a method of purging. The method is said to recover about 50% more material than under the best conditions with steam. The method employs a tank kept under high vacuum continuously which can be made instantly available by rapid manipulation of valves. Extracted vapors may be reduced in volume before they reach the vacuum tank by passing them through a heat exchanger or by quenching them with a suitable liquid.

* * *

Lubricating oil. No. 2 095 538, *issued Oct.* 12, 1937, *filed May* 14, 1937; *A. C. Vobach, assignor to Sinclair Refining Co.; no drawing;* 7 *claims.*

Free stearic or palmitic acid or a mixture (.0035-0.5%, for example), and calcium phenyl stearate or a mixture with calcium stearate (0.5-2.5%, for example), are added to lubricating oil to improve quality under higher pressure and temperature conditions. The improved also is said to have a high solvent capacity for sludge formed by oxidation so as to render engines in which they are used self-cleaning to some extent.

* * *

Naphthenic acid. No. 2 093 001, *issued Sept.* 14, 1937; *filed Nov.* 25, 1935; *A. L. Blount, assignor to Union Oil Co.; one drawing;* 20 *claims.*

Alkali wastes obtained from petroleum are refined to produce refined naphthenic acids. Naphthenic acids are added to the alkali wastes to neutralize alkalinity, imparting all the heat necessary to evaporate all of the constituents except naphthenate soaps. Vaporized materials are separated and the naphthenate soaps treated to obtain the naphthenic acids.

One object was to obviate defects of using sulfuric acid for neutralization and avoid using inorganic acids as well as the subsequent neutralization of the acidified alkali wastes with an alkali.

Activities OF EQUIPMENT MANUFACTURERS

Wrought Iron

"101 Uses for Wrought Iron" are pictured in a new bulletin of this title, being distributed by the A. M. Byers Co., Pittsburgh. The booklet is said to be the most comprehensive picture of where and how wrought iron is used that has ever been published. Containing over 100 pictures, each represents a different use where wrought iron is said to be capable of lasting longer and costing less than other materials.

One of the applications is pipelines on the deck of the tanker New Haven Socony, recently placed in service. Another is oil lease tanks on the Bloomer Lease in Kansas where galvanized wrought iron sheets are employed to resist corrosive sour crude oil. Four wrought iron furnace stacks are used by Shell Petroleum Corp. at Houston. Wrought iron is used for an underground fuel oil tank by a large Pittsburgh manufacturing plant.

* * *

Instrument Catalog

Precision Scientific Co., 1730-1754 N. Springfield Ave., Chicago, announce a new catalog 400 of laboratory appliances.

* * *

Steam Trap Handbook

Steam Hook-ups, a new book just issued by Sarco Co., Inc., 183 Madison Ave., New York, is said to be an innovation in the steam trapping field. It is based on an accumulation of data over a 25-year period. Principal sections cover methods for calculating trap sizes, hook-ups and descriptions of various types of heating systems, hook-ups for process steam application, steam headers, and temperature control, and descriptions of the fundamental characteristics of the various types of steam traps, temperature regulators, and steam accessories.

* * *

Industrial Thermometers

A new industrial thermometer catalog, No. 1125B, has just been published by C. J. Tagliabue Mfg. Co., Park and Nostrand Aves., Brooklyn. Listings of the complete line of these thermometers are included in this 24-page booklet. Pages are filled with information about construction of the instruments with illustrations showing forms and connections for various applications.

* * *

Controller

Two new bulletins are announced by Wheelco Instruments Co., 1929 S. Halstead St., Chicago, on Capacitrols and the new proportioning controller.

* * *

Honorary Degree Conferred

E. G. Bailey, vice-president of The Babcock & Wilcox Co., New York, and president of Bailey Meter Co., Cleveland, was honored by Lehigh University at its Founder's Day exercises at Bethlehem, Pa., with the honorary degree of Doctor of Engineering. The degree was conferred for "notable and distinguished accomplishment in the field of combustion and steam engineering."

* * *

A new bulletin (7500-C) describing Hancock Flo-control valves is announced by Hancock Valve Division, Bridgeport, Conn. This valve has been completely redesigned and prices lowered. One of the features of the valve is its V-port proportional flow disc and micrometer adjustment dial and pointer.

* * *

Steel Walled Building

First large-scale use of enameled steel walls has been made by the American Rolling Mill Co., for its new laboratory at Middletown, Ohio. Costing $280,000, the new building was dedicated recently, Charles F. Kettering, vice-president in charge of research, General Motors Corp., making the address which was broadcast over a nation-wide network.

The building is a single-story structure with 255-foot frontage and depth of 175 feet. Structural steel framework is all welded. Blended in colorful harmony are porcelain enameled iron, stainless, steel, and glass block. The building was erected by the Austin Co.

* * *

Naphthenic Soap Emulsions

S. Schwabacher & Co., New York, call attention to an article on "Naphthenic Soap Emulsions" published in the magazine "Soap" for November, 1937. A number of industrial applications of mineral oil residues as emulsifying and bodying agents are discussed. Odor, which has been an obstacle to certain uses heretofore, is said to have been improved materially in some naphthenic residues now on the market.

* * *

Insulation

Publication of a new 32-page insulation catalog (Form IN-55 A) is announced by Johns-Manville, 22 E. 40th St., New York. An added feature of this catalog is a section dealing with the new JM-20 insulating brick designed as a back-up insulation behind fire brick lining and as an insulating-refractory.

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This index is published as a convenience to the reader. Every care is taken to make it accurate, but National Petroleum News assumes no responsibility for errors or omissions

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Condenser Service & Engineering Co. R-404
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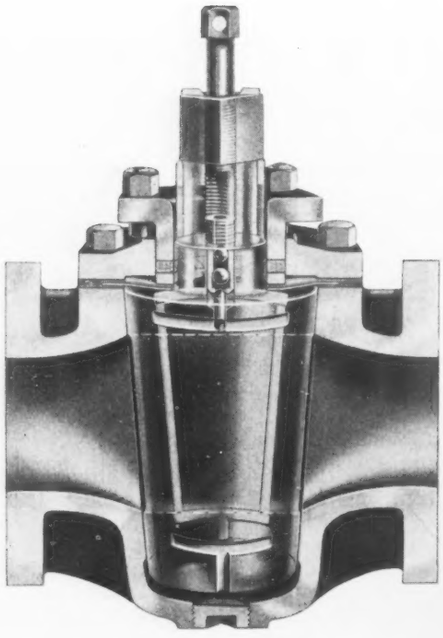


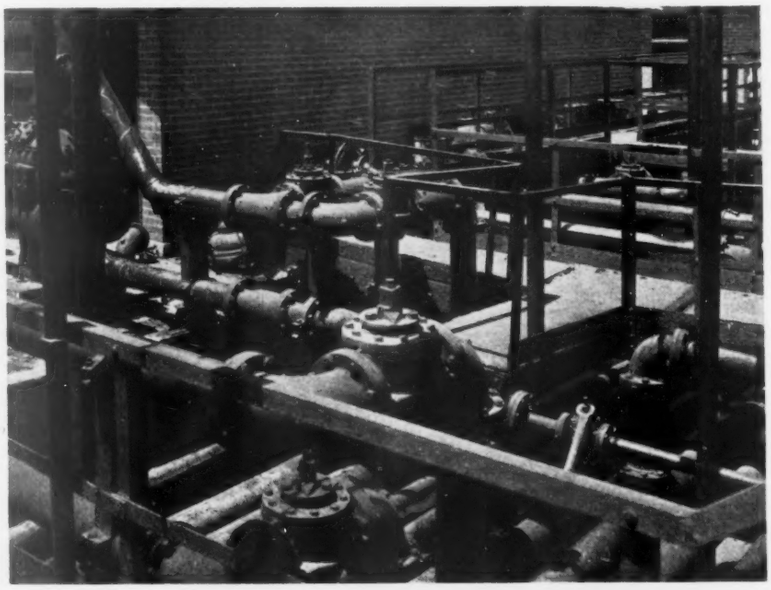
A valve's function is to open and close

Above is shown 6" Nordstrom high-pressure valves on gasoline charge lines to treating tanks in mid-continent refinery.

Nordstrom high-pressure valves on 4" and 6" lines in gasoline transfer pump house manifold in a Texas refinery.

Basically, all valves are designed for but one purpose—to open and to close—easily, quickly and without leakage. Nordstrom's do this and then some. They fit your engineering plans perfectly. They offer a minimum of 100% safety factor. They are available in pressure ratings up to 3,000 pounds and offer efficient operation at temperatures from -60° to +600° F. Positive shut-off and long life is assured because of "Sealdport" lubrication. Other features involve quick operation through quarter-turn,—economy of space because of compactness and simple construction,—insured quality and safety by rigid inspection and safety factors.

A wide range of types and sizes is available; also gate valve face-to-face dimensions. Adequate supplies are carried in principal distributing centers permitting quick deliveries to meet your needs. Bulletins upon request.



NORDSTROM VALVES

LUBRICATED PLUG

MERCO-NORDSTROM VALVE CO.
A Subsidiary of
PITTSBURGH EQUITABLE METER CO.
MAIN OFFICES: Pittsburgh, Penna.
Branch Offices in All Important Cities

"SEALDPORT" LUBRICATION
PATENTED

The new Roosevelt Highway along the coast north of Santa Monica is filled to capacity with motor traffic and scenes such as this are not uncommon throughout the year

June In January

By JACK N. WESTSMITH
N. P. N. Staff Writer

"YES, fill it up. You're right, it is time for an oil change and lubrication. Do that and I'll pick the car up in about an hour.

"What's that? You say the right front tire is pretty far gone? It is, isn't it? Guess you had better put on a new casing and tube, and it would be fine if you would check the other tires for nails and glass.

"Yes, check the spark plugs and put in new ones if your test shows any are bad. I'm on my way to California and I don't want car trouble on the road."

No, this is not a service station operator's dream and the destination, instead of California, may be any one of the numerous vacation spots favored by that growing nomadic tribe of winter tourists.

But it is typical of some of the extra sales possibilities open to the service station business man in the home towns of millions of car owners, who, between Nov. 1, 1937, and May 1, 1938, will migrate to their favorite resort areas for their winter vacations.

Records show that a large and growing percentage—now far more than a majority—of these winter travelers drive to the winter playgrounds and that they will average more than 500 miles on the trip. Also the average tourist spends approximately 40 per cent of his total vacation expenditure enroute to and from the resort areas.

This increasing use of the automobile by tourists gives the oil marketing company and service station operator along the main routes of travel repeated opportunities to contact these "itching-footers" for sales possibilities missed by the "home" service station. In fact, they can catch the tourist both going and coming.

Not to sound mercenary, but this nation-wide trek of motorists is a perfect setup for the alert station salesman. Tourists, particularly, will not stand for the high-pressure type of selling, but if the tires are worn, spark plugs fouled, fan-belts frayed or broken, and the car needs lubrication or any one of the other numerous items and services offered by the modern service station, then he is usually a willing buyer.

However, it is up to the station salesman to make the opening toward a sale. As a supervisor of stations for one national marketing company points out to his dealer accounts in the Los Angeles area: "See a need. Tell a need. Sell a need."

The same opportunity for extra profit sales holds true when the tourist arrives in the winter vacationland. Actually the possibilities are greater then, since the visitor will remain in one place for a longer period and will provide more chances for contact.

However, the contacting of tourist trade is not a hit-or-miss proposition with service station business men on the west coast. Operators of stations in hotel and apartment-house districts catering to the tourist know the visitor will be a good customer and make active solicitations for his business.

OFTEN arrangements are made with the apartment-house manager whereby the tourist is directed to the particular station. Permission is usually given the station salesman to make actual calls on the new arrival in an effort to line him up, or at least acquaint him with the station personnel and location.

One progressive operator averaged 35 tourist customers a month during the 1936 season by use of a neat and attractive card placed near the phone in several large hotels and apartments near his station. This memorandum gave the station location, name of the operator and the products and services offered.

The writer on a 4700-mile, Five-Gallon buying trip through the Pacific northwest last summer found similar cards in autocourts, calling attention to service stations on the premises or near-by and emphasizing an open all night service department, featuring lubrication. One operator in Provo, Utah, said he averaged between 5 and 6 lubrication jobs a night from visitors

to the autocourt during the season.

With the service stations at home, along the way, and at the resort areas all set to take care of tourist needs, we might turn our attention to estimates of travel to one of these vacation-lands.

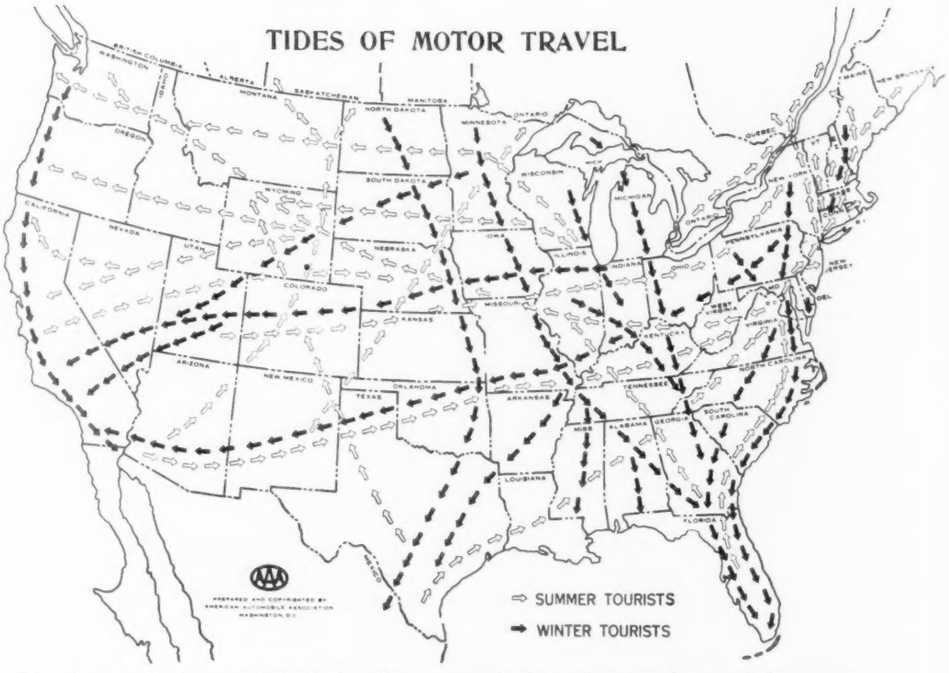
STATISTICS compiled by the All-Year Club of Southern California—a non profit organization for developing tourist travel to this area—indicated 529,135 out-of-state visitors in the November to May (1936-37) period spent approximately $84,125,465. Each winter tourist stayed on the average of 36 days and spent $159. This is for ten counties in Southern California.

Of this total, about 165,000 tourists in 1936 stayed an average of 78 days and spent $408 each.

For the winter season of 1937-38, it is estimated about 600,000 tourists will come to Southern California and, if the 1936 figures hold true, will spend nearly $100,000,000 in the six-month period.

On the basis that the tourist will spend 40 per cent of his funds enroute to and from his destination, these 600,000 visitors will distribute about $80,000,000 outside of California. The 40 per cent figure was determined from questionnaires answered by tourists to this area in other seasons.

Previous surveys also showed that 67 per cent of all tourists to California come by automobile, which would indicate that more than 400,000 visitors will motor to this state in the 1937-38 season.



How the currents of motor touring in the winter converge in the south, the southwest and the extreme west is shown in the accompanying map prepared by the American Automobile Association. Even in the northern states, marketers with stations on the routes the tourists use in their trek south will profit from the motorists driving south in the winter months. Dark arrows show the tide of winter touring, the light arrows summer touring

Records for the year 1936, including both summer and winter tourists, showed 1,183,163 passengers arrived in 434,000 cars, or an average of 2.73 passengers per car. On this basis, the 400,000 winter tourists expected in the coming season would travel in approximately 147,000 cars.

Expanding an estimate of expenditure breakdown for the 1936 winter season, it is indicated about $5,000,000 will be spent for gasoline and oil and about $10,000,000 for automobiles and accessories in the 1937 season. Tires, batteries, and lubrication, car washing and polishing services will help swell extra profit service station sales to these customers.

To the oil company and service station catering to motorists on the way to California, a breakdown of travel through the various ports of entry into the state might be of interest.

FOR the ten months of 1937—to Nov. 1—201,715 cars with 583,231 passengers—2.89 per car—entered six southern border points, an increase of 15.9 per cent over the same period in 1936.

Through the northern entry points, 361,519 passengers entered in 136,165 cars—2.65 per car—an increase of 11.5 per cent over 1936.

For the east-central stations, 62,525 cars, carrying 159,374 passengers—2.55 per car—an increase of 6.9 per cent. These stations were opened in May.

Recapitulation of these figures shows that for the ten-months period 400,405 cars carried 1,104,124 out-of-state tourists into California—an average of 2.75 passengers per car. This travel is 13.1 per cent ahead of the total for a similar period in 1936.

Of interest to the business man in Southern California and particularly the oil marketing company, is the fact that 80 per cent of motoring visitors entering through the northern and east-central border points also come to the southern part of the state.

Winter Gallonage Runs High

In 12 states in the southern and southwestern portion of this country generally regarded as the territory of winter touring, gasoline consumption for the six winter months, starting with December, holds close to the so-called summer gallonage of the remaining six months. In some individual states, notably Florida, winter gallonage is larger than that in summer.

Without the factor of the steady increase in gallonage which has held true in practically this entire period, and which affects the gallonage of the later months of the year more than the earlier months, gasoline consumption in several of these states would be consistently higher in winter than summer.

The 12 states are Alabama, Arizona, California, Florida, Georgia, Louisiana, Mississippi, New Mexico, N. Carolina, S. Carolina, Tennessee and Texas.

	*Winter	*Summer
	(Figures in Gallons)	
†1929	1,120,198,000	1,275,349,000
†1930	1,192,370,000	1,265,788,000
1931	1,767,752,000	2,005,165,000
1932	1,757,186,000	1,831,052,000
1933	1,858,669,000	1,898,138,000
1934	1,862,490,000	2,008,367,000
1935	2,005,674,000	2,306,231,000
1936	2,307,215,000	2,565,194,000
Total, 1929-1936	13,871,554,000	15,155,284,000
Decrease, Winter		8.47%

*Winter months include December of the previous year, January to May inclusive, of the designated year. Summer months include June to November, inclusive.

†California figures not available on a comparable basis previous to 1931.

Much of the success in prolonging tourist stay in Southern California can be traced to an information bureau opened by the All-Year Club in Los Angeles last June. The bureau is "manned" by five "Welcomettes," dressed in uniforms done in the California colors of blue and gold.

Since its opening, the bureau has served more than 50,000 tourists, and is now handling on an average of one every minute and a half. The idea was the result of a survey which indicated many visitors spent half of the vacation period in finding things to do and points of interest to see.

THE five girl attendants were picked from a group of 200 and then put through a two-month training course in which they personally visited every point of interest in Southern California.

Each visitor to the bureau is given a guide book of the area and a Los Angeles county sight-seeing map, which includes all important towns and highways and the location of points of interest. The bureau outlines side trips for the visitor so that he may spent most of his time seeing and doing.

In all, there are 26 free services offered by the bureau. Arrangements are made for the visitor to see national radio broadcasts, polo games, visit the Huntington Library and guest cards are available for several beach clubs and for an angling club.

A Welcomette at the information bureau maintained in Los Angeles by the All-Year Club points out interesting motor trips on the large scale sight-seeing map. Some 26 free services are offered by the bureau, all to the end of prolonging the tourist's stay in that region

Tourist Trade Builds Gallonage

The relation of winter gasoline consumption to consumption during the summer months in Florida, California and Arizona is shown in the table below. In Florida winter consumption — December through May — is considerably larger than that for the summer period of June through November. In the other states it is only moderately less.

During all this period gasoline consumption generally was gaining, the effect being more noticeable in the later months of the year than the early months, without which factor winter consumption would consistently be higher in these states, as well as other states in the south and southwest. Winter gallonage in California is growing at a faster rate than summer gallonage, despite the fact that only a part of its area is generally included in winter touring territory.

	Consumption (In Thousands of Gallons)		Per Cent of Change			
	*Winter	*Summer	Winter Over Summer	Winter Over Winter	Summer Over Summer	Entire Year's Change
FLORIDA						
1929	121,901	101,728	+19.83	— 1.26	— 2.58	— 1.21
1930	125,066	91,942	+36.03	+ 2.60	— 9.62	+ 1.59
1931	126,803	105,943	+19.69	+ 1.39	+15.23	+ 1.47
1932	117,579	93,111	+26.28	— 7.27	—12.11	— 9.95
1933	110,937	93,048	+19.22	— 5.65	— 0.07	— 1.60
1934	126,416	107,015	+18.13	+13.95	+15.01	+16.89
1935	157,675	135,206	+16.62	+24.73	+26.34	+11.08
1936	172,029	138,443	+24.26	+ 9.10	+ 2.39	+ 3.94
CALIFORNIA						
1932	654,991	699,308	— 6.34	— 9.72	— 9.19	— 3.49
1933	624,619	705,991	—11.53	— 4.64	+ 9.56	— 2.19
1934	656,050	662,757	— 1.01	+ 5.03	— 6.12	+ 0.81
1935	668,816	810,476	—17.48	+ 1.95	+22.29	+10.93
1936	780,755	847,338	— 7.86	+16.74	+ 4.55	+ 9.69
ARIZONA						
1929	33,315	37,354	—10.81	+39.61	+27.30	+26.84
1930	38,966	37,593	+ 3.65	+16.96	+ 0.64	+ 4.37
1931	37,196	37,706	— 1.35	— 4.54	+ 0.30	— 2.08
1932	35,388	34,600	+ 2.28	— 4.86	— 8.98	— 6.54
1933	31,303	32,967	— 5.05	—11.54	— 4.72	— 3.96
1934	35,619	37,183	— 4.20	+13.79	+12.79	+13.51
1935	37,855	42,119	—10.12	+ 6.28	+13.27	+10.62
1936	46,859	48,789	— 3.96	+23.78	+15.84	+18.09

* Winter months include December of the previous year and January to May inclusive of the year designated, while summer months include June to November inclusive.

Arrangements are also made for the visitor to go through orange packing plants, canneries, pottery, kilns, avocado packing plants, automobile and airplane assembly plants and various other factories and industrial plants in this area.

As another means of making the tourist feel at home, the bureau offers him its mailing address in cases where the California stopping place is not known in advance.

THIS tourist service bureau is paying large dividends in the form of longer stop-overs by visitors to the Southern California area. It also points to a similar service possible to the service stations along routes of travel taken by these winter tourists.

That is, these enroute stations can often prolong the tourist contact by keeping him informed of interesting side-trips off the main highway. After all, the average tourist, winter or summer, is out to see the country and will listen to suggestions concerning historic or scenic spots off the beaten track.

As an example of the willingness of a tourist to be shown, is a visitor from Germany, who had seen several attractions in Southern California and announced to the bureau he was ready to move on to New York.

A Welcomette spent an hour telling him of the interesting things he had missed. A month later he returned

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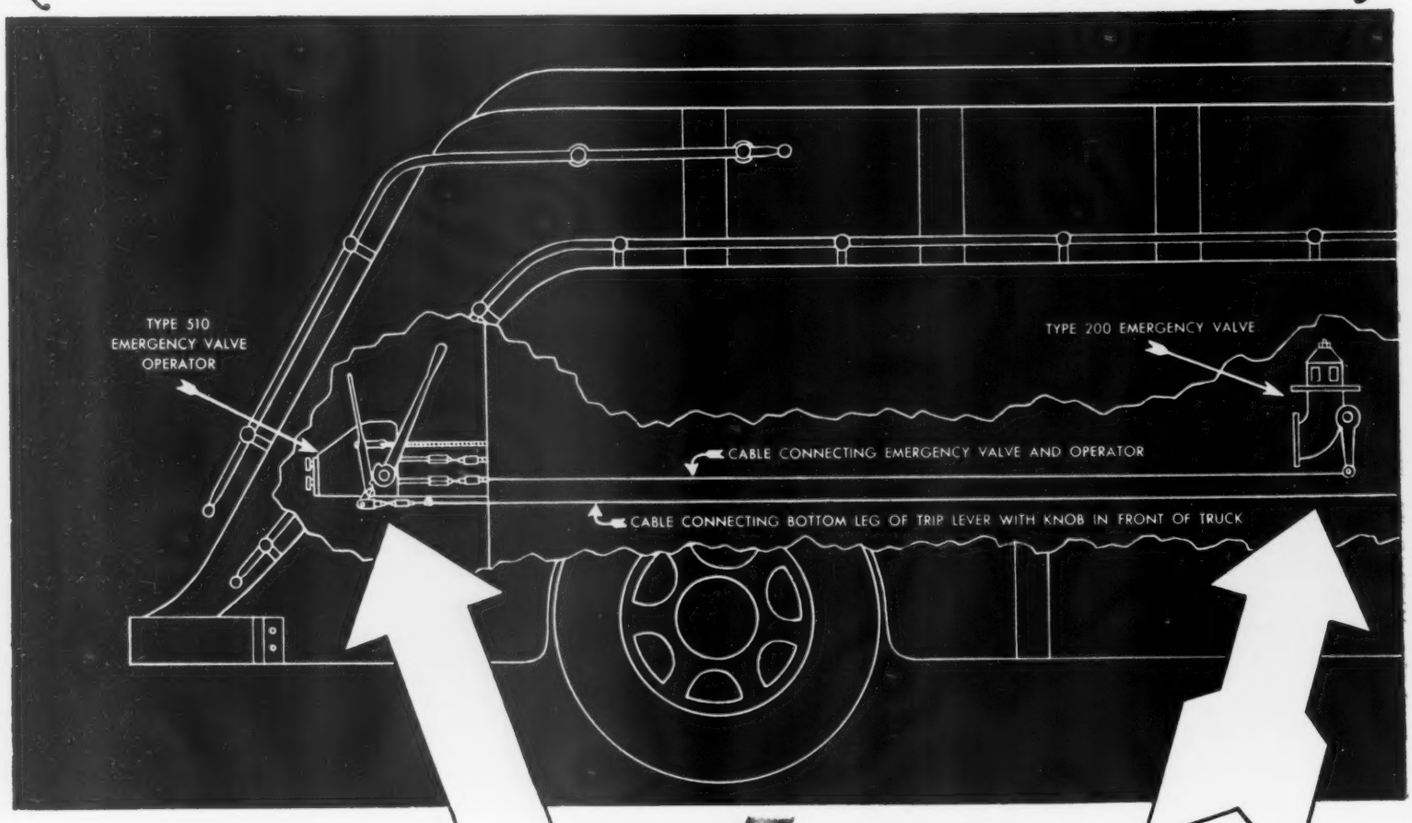
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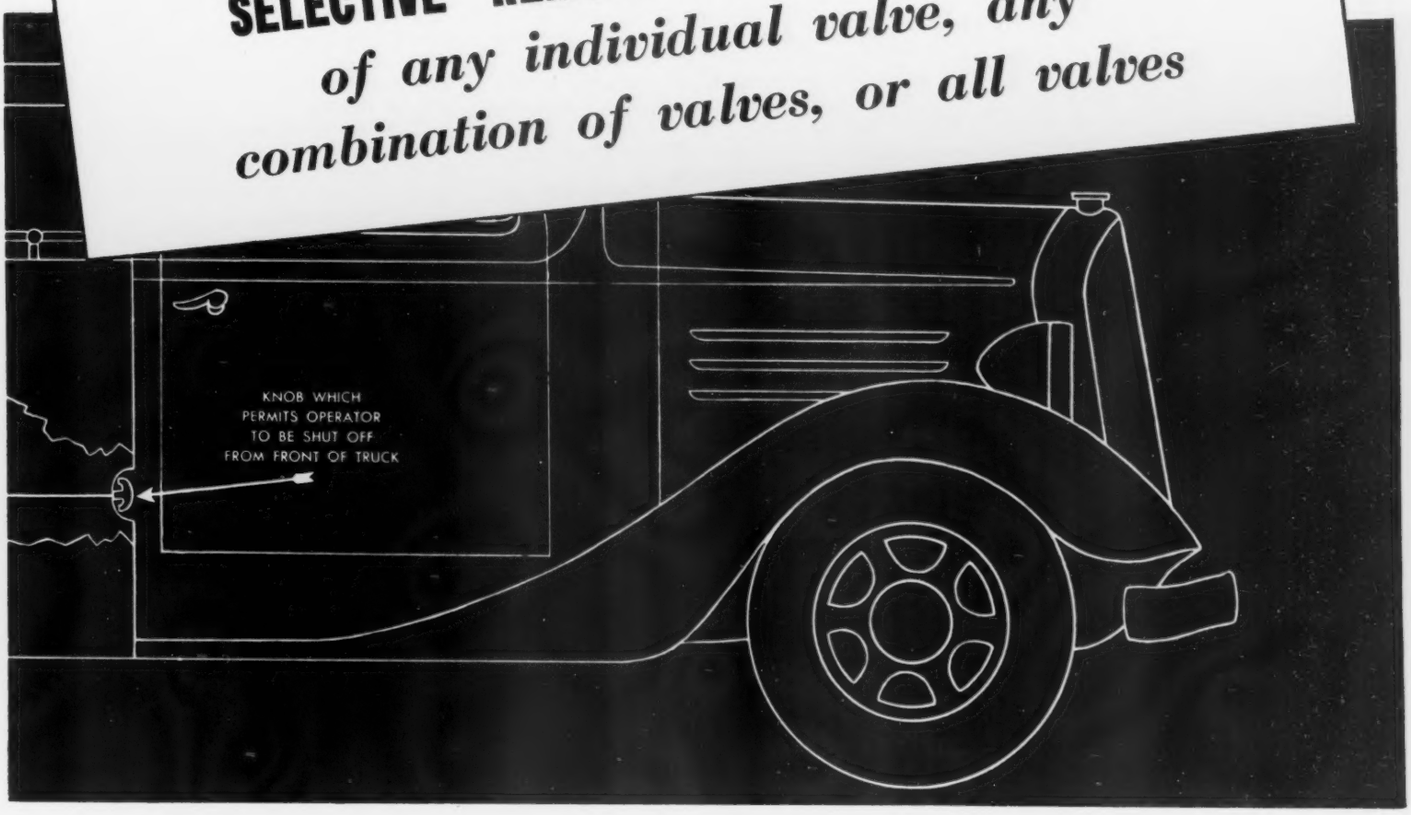

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to say: "I'm still here, and it's all your fault. You've showed me so much to see and do I've been going almost day and night, getting it all in. But it's been immense fun and I'm going to stay another week to finish up."

There are many cases on record where the activities of this information bureau have extended the stay of tourists in this area from two days to upward of five weeks longer than the original plans.

Analysis of 1900 questions asked by tourists at the bureau in the first month it was open indicated that primarily the visitor is interested in having a good time and then he wants to see all the cities and towns and points of interest his time will permit.

Some 525 questions asked for information on specific pleasure resorts where the tourist could find an opportunity for relaxation and such recreation as dancing, swimming, tennis, golf and horseback riding.

Next in number were 511 questions about Southern California cities, how to reach them, what were their chief points of interest, which were the best restaurants and hotels.

Culture interest played an important part in the questions, with 472 asking for information about such attractions as museums, libraries, dramatic festivals, pageants and musical productions.

Frequently tourists ask unusual questions, the survey showed, such as "Is a Mexican marriage legal?" and "Where can I buy dry ice?"

The bureau found many tourists were interested in Hollywood and the film people, so included on its sightseeing map addresses of many important actors and actresses and outlined a drive around an area in which is concentrated a representative group of movie residences.

"English Village"

TRAVELERS rounding the turn on U. S. Highway 11, the historic Shenandoah valley pike, just outside of Roanoke, Va., feel the "pull" of the English village, even though they had planned to drive another hundred miles before stopping for the night.

Nestled in the mountains, where the road forks to Bristol and Roanoke, this village of white cottages with blue-gabled roofs is too neat and substantial-looking to be called a "tourist camp."

Driving in, H. L. Pepoon, the manager, is proud to show visitors around. There are six single cottages and two doubles—that is, two-bedroom cottages with connecting bath.

The inside bears out the promise of the attractive exterior, with its clean, unscarred furniture, rugs, dressing table and bureau, radio and curtains to make it home-like. Adjoining the large bedroom is a neat bathroom with complete toilet facilities, hot and cold water. Each cottage is steam-heated by a central heating plant.

The restaurant, like the filling station, is a model of cleanliness, and as modern as a coffee shop in a new, big city hotel.

Mr. Pepoon, who leases the village from Pure Oil Co., said that from its opening last May up to mid-fall, he turned away people each night. With the start of the winter trek southward, he expects the "full" sign will be needed again.

Like other successful tourist camp operators, Mr. Pepoon believes that the most important management detail is preservation of the camp's reputation. His English village is always "full" when a baggageless couple or some nondescript car overflowing with tin-can tourists of the "gypsy" type drives in.

English village type of tourist camp on the outskirts of Roanoke, Va.

ADVERTISING PAGES REMOVED

The lure of hundreds of miles of beaches on the Atlantic ocean, Gulf and in southern California, brings increasing thousands of winter vacationists each year to motor to the southern states. This scene is on the public bathing beach at Miami, Fla.

Man-In-A-Trailer Snowbound . . . But He Won't Be Long

By SAM A. WEISSENBURGER

• • •

THE first November snow storm is sweeping in over Cleveland from the north off the tumbled waves of Lake Erie. The breakwater is covered with ice and far off a mournful call of the fog horn is warning late ships to watch out as they try to make harbor. People are hurrying by, with heads down, while the boisterous winds blow skirts and overcoats about, and the grey depressing day is almost as dull as it was at six-thirty this morning, although it is now high noon. The time for the annual pilgrimage to the southlands is here.

A thousand miles away it is June in December. Down in Florida the sun shines, the beaches are alive with color and movement, the tarpon are leaping in the Gulf, and hundreds of trailers are vagabonding toward their favorite camps.

Last year at this time, we were there. We watched our friends of the road drive in to Winter Garden. We were there to point with pride to the new swimming pool, to suggest they split the cost of a fishing trip with us, to ask some sprightly trailer wife if she would dance with us that very evening.

Tongues flew with gossip and good wishes, smiles of contentment were on faces, and everybody was congratulating themselves that they would escape the northern winters and, in their trailers, be carefree and thrifty as they loafed in the perpetual summer that has lured them thousands of miles from northern homes, now snow bound and remote.

As you read this, a great caravan is on the move. Thousands and thousands of people are starting off toward the land of heart's desire. From every state, yes, from every county in every state, there are, or soon will be, trailerites winding down the trails to summer. Before the coldest weather grips the Northland in its icy grasp, more than a million men and women will pry themselves loose from winter and follow the sun.

In trailers, those modern versions of the old prairie schooners, these million people will be on the move. Many of these modern nomads are sons and daughters of old pioneer stock, who bundled up their families, a few farm tools, a package or two of garden flower seeds, and faced the setting sun, looking for the Promised Land.

Others are the grandsons and granddaughters of the restless people who left Europe to adventure in search of fortune in America. At any rate, the people you see in trailers are not gypsies, except by choice. They are not the rag-tail floaters, but most of them are good, conservative Americans with a substantial stake in their country.

These trailerites are seeking pleasure and leisure. Many of them are in

A great share of the gasoline gallonage throughout the south is distributed through water terminals from which transport trucks haul inland. This is the loading rack at the water terminal of the Republic Oil Co. at Jacksonville, Fla.

the afternoon of life; their wants may be simple, but they have the money to pay for what they want. The trailer fits into their scheme of living very neatly.

While on the way back and forth between their winter homes and the places they spend the summer months, these trailerites know they must have transportation. To them transportation means gasoline, oil and grease, and tires, batteries and gadgets. To trailerites all the things you sell in the gasoline service station are simply means to the end. The end being to get somewhere else than from where they are.

TO YOU, the trailerites should prove to be another channel for additional business. Don't let the comic strips fool you. Trailerites are not panhandlers, nor down and outers. They have money to spend. Like the rest of us they just don't spend money without some mental pain, but if you have something that they want more than they do the money in their purses, you can sell the merchandise and get spot cash for it.

In the many months we have been on the road, we have become acquainted with many hundreds of these trailerites. We belong to their organizations, we know the pass words and grips. We have loafed with them, gone fishing with them and listened to the stories of their lives and how the "children back home" are getting along while Grandma and Grandpa cruise around in their trailer in parts of this country they never had expected to see. We think we know a good cross section of the men and women who have chosen trailers as their winter homes. And incidentally we have found them just about the types of people we knew when we lived in Cleveland.

Maybe they have just a bit more of the "Itching Foot" and just a suspicion more of restlessness than many of our former neighbors, but just as in millions of other American homes, life goes on much the same. If they have children along, the children go to school. The family goes to an occasional movie; they go to church on Sunday. They shop for groceries and meats and fresh vegetables with just as much shrewdness as if they were on Main Street back home. They made their money by savings, not usually by investments, and they are thrifty. They must have money or they wouldn't be trailerites. First of all they had to make a substantial investment before they started out.

Here are a few figures that should convince you as oil merchants that these trailerites are prosperous and mighty good prospects for your best salesmanship. The following is an average. The original investment for an automobile is about $1000. The investment for a trailer, completely equipped is another $1000. Most of the trailerites know that they will cover more than 2500 miles during the winter, many of them will travel 10,000 miles. But for conservative figuring let us say 2500 miles. At the "maximizing of the minimum", as Amos and Andy would say, you can't drive that many miles and invest less than $200 for gasoline, oil and grease. Then they figure on being away for at least four or five months.

You can't live in a trailer on less than $100 to $150 a month. Let us see what this budget will cost them for the four months in the Southland. Roughly about $2600. Now that does not include clothes, gifts, or very much entertainment. It is obvious that most of them do no work, they are living on pensions, annuities and savings.

SO THE trailerites must know where they can lay their hands on $3000 if they buy a car and a trailer and start south for the season. They must be reasonably healthy, reasonably prosperous and reasonably good prospects to cultivate in the gasoline service stations.

Here's a tip. To most trailerites, their home on wheels, is more than a place to eat and sleep, it is their hobby. These people love their trailers with the devotion of a fisherman for his equipment, the golfer for his matched clubs, the college boy for his fraternity house. These trailerites, like other hobbyists, spend money on their hobbies.

Look through the columns of a trailer magazine. More gadgets are advertised than there is rice in China. They won't take chances with their automobiles. They require good tires, they want good oil, they insist on first class gasoline. They know that you can't get something for nothing. They won't take chances on a breakdown on the road.

A trailerite loses caste if he can't come into the camp and say with an assumed modesty, "Well, I drove clear from Crossingville, Maine, and never had a bit of trouble." He then can enter into the high society of trailer camps.

He takes care of his motor and his trailer with the same fidelity that he would take care of his horse or his

A station in the south that caters to the trailer trade. It is owned by the Charleston Oil Co. and is located at the foot of the picturesque Ashley River bridge on the entrance via U. S. Highway No. 17, into Charleston, S. C., from the south

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Coral Beach trailer camp on the southern California shore north of Santa Monica caters to out-of-state vacationists. Good surf fishing prolongs the trailerite's stay

tractor back on the farm. He depends on his car to get him there and back. He fixes up his trailer, or maybe we should say his wife does, with all the care of a bride going into an efficiency suite. They have good bedding, clean linens, pretty china and glass, good cooking utensils, and a score of labor saving devices to make life in the trailer even more leisurely.

YES, the trailerite has money to spend, and he is coming through your town and probably will stop at your station. He will if you show you want him; if your driveways are wide, if your station is clean, if you have attractive displays and the merchandise that he can use on his holiday trip away from the cares and the snow shovels of the North to the bathing girls and the palm trees of the south. But you must cultivate him just as you do other customers. You must know his wants, his prejudices, his preferences.

You must realize he needs white gasoline for his stove, and ice for the ice box. He needs flit to keep away mosquitoes and extra cans of oil, for the long back country trips; his wife will need cleaning fluids; and the old boy can be sold extra equipment for his car. He is a pushover for extra tools, although he may never use them.

He is likely to be worrying about his battery, or his tires, or a new oil filter. Spot lights for his car, electric light bulbs for the trailer, cup grease, extra tins for additional supply of gasoline, are just a few of the things that trailerites want to buy and complain that they are not able to find quickly in service stations.

And they love to eat! They all seem to have a sweet tooth, and chewing gum and cigarets are standard equipment. But if you have anything in the way of food to sell, bend over backward to make it look spotlessly clean. Of course, the main thing to sell them is the main thing you stock, the petroleum products. Not just gasoline and oil. When they stop don't forget to ask them to let you change their oil, and grease up the car.

We covered thousands of miles in our trailer, and only once were we 'sold" a greasing job, although we had stopped for lunch at plenty of stations. We bought probably a hundred grease jobs but we had to ask for them. It may be that greasing a car is dirty work, but there is profit in it. Not more than a half dozen times did any one ever suggest that we change from straight run gasoline to leaded gasoline.

Some day right soon, get a trailerite to stop and talk to you. Ask him to help you merchandise your station for the thousands of other trailerites. You will probably find him a smart fellow. He will tell you a great many things about service stations that might make your cheeks red, but don't be afraid of asking for advice. Ralph Waldo Emerson said "Egotism is God's gift to little men." And he wasn't talking about the size of the body, but about the size of the mind. So if you want to make big profits, you must be willing to ask for advice from those whose patronage helps you to make those profits.

This trailering business is already a big business and it is going to be a much greater one. Now is the time to prepare for the increased business that this new means of transportation is bringing to the oil business.

Lots of new angles are developing in this new business. Already the manufacturers are advertising "outfit your trailer as you do your home." Formerly you had to take the furnishings the manufacturer wanted you to have. The builders have found that their customers have better taste than they thought. Customers object to bad taste. That ought to be a hint to the service station operators. Trailerites want to patronize attractive looking service stations.

ARE there many trailers in the country? "Trailer Travel", a trade publication, is said to predict that the present year's production is 375,000. "Automotive Daily News" estimates the production of house trailers at 100,000. By the end of 1937, there will be 1,000,000 trailers on the road. If each of them will spend in a year at least $250 for petroleum products—and they will actually spend more—then the total business should bring about $250,000,000 additional business to the oil industry. Even in these days of box car figures of spending the tax payers' money, you must admit that it is still a tidy sum.

"Trailer Travel claims there are 700 factories turning out trailers. Not all of these are house trailers destined for vacationists. Hundreds of them are going to salesmen who will use them for display purposes as well as sleeping accommodations.

Commercial trailers are rapidly increasing. We saw one order given at the factory that sold me my trailer, of nearly one hundred trailers for a single manufacturer; and the general sales manager smiled, but did not seem surprised. That order alone totaled nearly $80,000. Not bad.

You are in service stations to make money. You make money out of people. Here are a great many people

In the FROZEN NORTH *or the Sunkissed South*

• • •

Motorists Can Be SURE WITH PURE

● Pure Oil dealers in the frozen North and the sunkissed South have a complete line of quality gasolines, motor oils, and lubricants, skillfully refined to meet the particular demands of motorists within their area. And these same dealers profit by Pure Oil's widespread distribution. Motorists on tour, as well as home folks, know that they can put their faith in Pure Oil trade-marked products and the "Friendly Neighbor" dealers who sell them.

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Heath, Ohio	Smith's Bluff, Texas	Chicago, Ill.	Norfolk, Va.	Reading, Pa.	Minneapolis, Minn.	Columbus, Ohio	Des Moines, Iowa
Toledo, Ohio	Midland, Mich.	New York, N.Y.	Atlanta, Ga.	Pittsburgh, Pa.	Duluth, Minn.	Cincinnati, Ohio	Tulsa, Okla.
Muskogee, Okla.	Cabin Creek Jct., W. Va.	Rochester, N.Y.	Indianapolis, Ind.	Newark, N. J.	Madison, Wisc.	Parkersburg, W. Va.	Beaumont, Texas

SALES OFFICES:

with money to spend. In the great department stores of the country, when a new fashion in living comes into sight, all the merchandise men and the advertising men go to work in a hurry to cash in on the new trends. They have to be quick on their feet to get any profit out of the fast changing fashion pictures. This fashion of living in trailers comes ready made to the oil industry, and it promises to keep growing.

The trailerites can't travel without the aid of the oil industry, and they won't stay at home. And a final word of advice, which is probably not needed. You would not be in a store, for that is what a gasoline service station really is, if you did not like people. Strangely enough, we have met salesmen in stations that reminded me of the story of the old Roman Emperor, Caligula. You remember he is reported to have said, "I wish all humanity had one throat, so that I could cut it."

If a service station man, or any merchant, feels that way about people then he is in the wrong business. He is headed straight for failure. For the love of people is the corner stone of merchandising. If you want the business of trailerites, you must smile when you say to them "Shall I fill 'er up?" For the trailerite is on his way to his big adventure. He wants the whole world to help him celebrate and he is willing and able to pay the fiddler.

Now this winter afternoon is drawing to a close. We are looking out on the cold, grey lake. It looks like a sheet of lead. Snow covers the lake front and across the street a small manufacturing plant is operating. The windows on one floor are lighted, but most of the other floors are dark. A taxicab crawls by with the monotonous clank of a broken chain hitting the fender. Office workers and factory hands are going home in the murky dusk.

But we are thinking of our trailer. It seems more than ever like a magic carpet. It will take us away from the coal smoke and the icy pavements. Like many thousands of other trailerites, the lure of the sunshine is too much. So we will be starting, and our way to the golden beaches of Florida will be spangled with service stations.

We will be coming your way. Get ready for us. Throw out your welcome signs and we will come in with a song in our heart and money in our pocket. For America belongs to us. We are the new customers of the oil industry. We are coming nearly a million strong. Leisure, the itching foot, and the summer lands along the Gulf of Mexico are three strong allies of the service station merchant. We are bound to the Riviera of America and that place is somewhere south of the snow line and it takes plenty of gasoline to get us there.

Modern Florida Station Offers All-Night Storage

TOURISTS in Pensacola, Fla., will find a modern one-stop station of the Sherrill Oil Co. at Garden and Baylen Sts., just back of the San Carlos hotel and across the parkway from the Manhattan hotel.

The building is clay tile with stucco and the tower has a steel frame. Colors are white trimmed with blue and the canopy signs are in red neon. The building is steam heated, and ceilings are of insulating tile, made in Pensacola.

The station office, salesroom, main pump islands and a two-car lubrication and service court are to the left of the garage storage entrance. A large service court, and tire and battery departments are to the right of the storage entrance. The station is open all night with a skeleton crew of storage garage attendants. With steel casement sash in the office, salesroom and lubrication rooms there is plenty of room for merchandise display, and visibility of the drives is excellent.

The station sells motor fuel, oil, lubrication, tires, batteries, ignition service, washing and polishing, accessories and storage.

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More than 600 OILCO tank car and truck loaders now in use.

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Bottom flexible loader tube . . . Gas tight sliding sleeve . . . Vacuum breaker for releasing liquid in sleeve . . . Has counter balance weights which hold loader in upright position when not in use.

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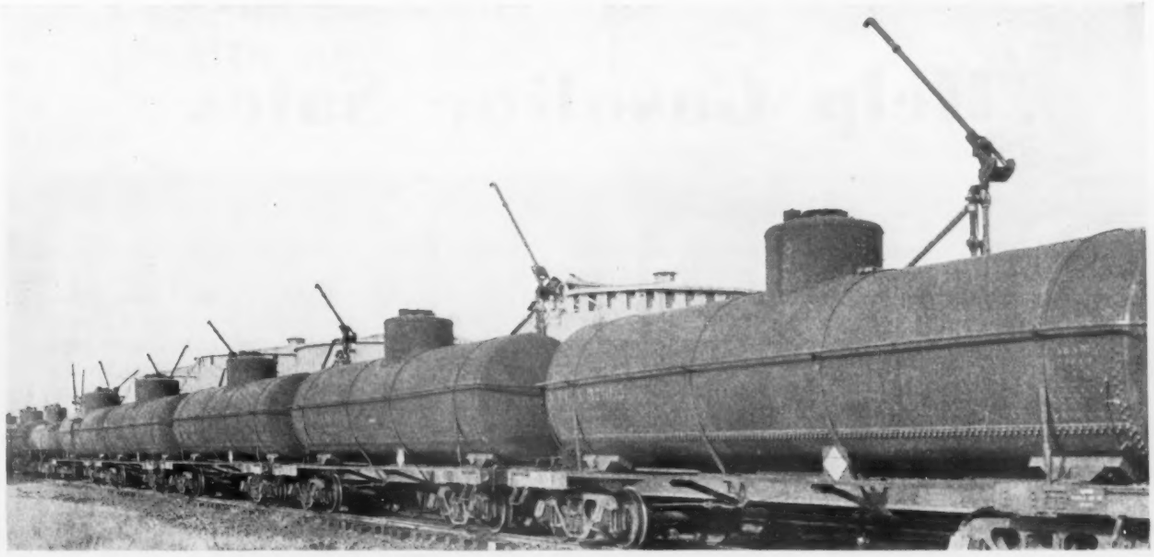

A 32 tank car installation. Loading rack in center, with 16 cars on each side.

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Manufacturers of OILCO TANK CAR AND TRUCK LOADING AND UNLOADING ASSEMBLIES, FLEXIBLE SWING JOINTS FOR HIGH PRESSURES.

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Skiing, skating, coasting, tobogganing are becoming increasingly popular, and thereby help the winter gasoline and oil market. This scene is in Paradise Valley, Mount Rainier National Park, Washington state, but it is being duplicated in many state and national parks over the country

Winter Sports, Too, Help Gasoline Sales

"WELL, son, it's gettin' along toward Christmas; reckon we better jack up the car for the winter."

"Them days," to quote a popular phrase, "are gone forever," and in their place has come the "winter touring season," almost as lucrative to the enterprising service station man as the summer touring season.

Now-a-days, travel doesn't hesitate for a few degrees of temperature, a few snowdrifts, or a bit of ice on lakes, ponds and rivers of the north country—in fact, these things are providing a stimulus for even greater winter travel in the region's winter visits.

Winter sports have become more and more popular during the last few years. Ice skating, skiing, snowshoeing, climbing wintry trails, all are now available to the city dweller, mostly through motor travel.

Not only this, but long-distance touring—whether to visit winter resorts or to seek out summer climes in January—has grown up with the comfort of the closed car, the automobile heater, windshield defroster. "Winter touring year by year is gaining an increasingly important position in the national spotlight," the American Automobile Association reports.

The National Park Service of Washington has under its wing some 140 park and recreation areas, including the 26 national parks, 74 national monuments, 11 national military parks, 11 national cemeteries, eight national battlefield sites, eight national memorials, two national historical parks, and the National Capital Parks and National Parkway in and near Washington.

Most of these are open in the winter. Of the 26 national parks, all but three are open the year 'round—an innovation, since in former years a large number of them were closed for the winter. Winter sports may be enjoyed in many of the national parks and other areas—and besides, there are almost 1000 state parks and like recreation areas, and in most of the northern ones winter sports are available.

Several of the national parks, as well as the state parks, will be opened for winter travel this year for the first time. Among them is Shenandoah National Park, in Virginia, the park which topped the record during the past tourist season for most visitors.

Although it is in a "southern" state, Shenandoah park offers all the winter sports thrills of the more rigorous climates—skiing, mountain climbing, and covering dozens of miles of mountain trails on snowshoes.

MOST of the winter sports areas—national and state are in New England and the northern states, where there are hundreds of ski trails, skating surfaces, and like recreation spots. A new half-million dollar winter recreational center has recently been developed in the Balknap Mountains of New Hampshire, and rural areas of Connecticut, near the New York metropolitan area, do a big winter tourist business.

In New York state, Lake Placid and other nearby points have developed a large winter clientele, and the Mt. Van Hoevenberg bobsled run with its turns, twists and thrills, has brought many a traveler from afar to watch iron-nerved

Merry Christmas

... and a Prosperous New Year to Our Many Dealer and Jobber Friends ...

START THE NEW YEAR RIGHT WITH *New* REPUBLIC MOTOR OIL, AND REPUBLIC STREAMLINED POWER GASOLINE -- REFINED TO PERFORM EFFICIENTLY IN EVERY CLIMATE ---

BE INDEPENDENT WITH REPUBLIC!

REPUBLIC OIL CO.

BENEDUM TREES BLDG. PITTSBURGH PA.

"THE INDEPENDENT SUPPLIER FOR INDEPENDENT JOBBERS"

SALES OFFICES

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young men steer sleds around its hooks at breakneck speeds.

Farther west other winter sports areas have been opened up, such as Idaho's Sun Valley, Sequoia National Park in California, Rocky Mountain National Park in Colorado, and the hundreds of lakes in the country's "lake region" of the northwest.

Contributing no little to the recent popularity of winter sports have been motion pictures featuring Sonia Henje and other stars of the winter sports stage—"One In A Million," "I Met Him In Paris," and "Thin Ice," all of which have aided in bringing new thrills to thousands who never knew the joys of the outdoors in winter.

Besides the 141 areas under supervision of the national park service, the number of state parks and recreation areas in every state is a revelation to almost everyone. A great many of these are open throughout the winter season. Oil marketers and station owners and operators will be surprised if they will learn how many recreational areas exist in their own territories. Here is a list of the state parks:

Alabama, 22; Arizona, 4; Arkansas, 7; California, 50; Colorado, 1 (Denver Mountain Park system, of 10,000 acres); Connecticut, 41; Delaware, 1; Florida, 6; Georgia, 10; Idaho, 1; Illinois, 21; Indiana, 14; Iowa, 56; Kansas, 27; Kentucky, 14; Louisiana, 11.

Maryland, 10; Massachusetts, 39; Michigan, 63; Minnesota, 17; Mississippi, 9; Missouri, 20; Montana, 2; Nebraska, 33; Nevada, 5; New Hampshire, 17; New Jersey, 17; New Mexico, 4; New York, 63; North Carolina, 7; North Dakota, 25.

Ohio, 33; Oklahoma, 9; Oregon, 35; Pennsylvania, 57; Rhode Island, 37; South Carolina, 11; South Dakota, 2; Tennessee, 10; Texas, 62; Vermont, 31; Virginia, 10; Washington, 44; West Virginia, 6; Wisconsin, 15; Wyoming, 4.

Besides offering an opportunity to the service station man to give information service, this newly developing winter touring should bring him revenues not otherwise coming in. Of course, to the amiable service station man who gives all of the ordinary services and information, perhaps the influx of tourists means only more gasoline and oil sales.

But there are hundreds of tourists who come to the snow-covered mountains of New England or other northern states not fully equipped for the sports they will find. Dark glasses, stocking caps, "blazers" and similar "winter" accoutrements, available to the tourists, would result in small outlay to the service station man, and might be a good source of revenue for him.

In the south, sun glasses are equally necessary, as are beach shoes, and other equipment—as well as automobile accessories, soft drinks, and a supply of information concerning nearby areas.

This last is a valuable asset for all persons serving the motorist, and may be obtained from the National Park Service in Washington, or through the state park services in most of the states.

There is no question that winter touring will continue to gain as it has been doing over the past several years, according to the American Automobile Association. One of the most important factors in the growth of winter travel, aside from improvement of the automobile, is the widespread effort of the northern states to perfect their snow removal operations. Practically all states in the snow belt have fine equipment and at the first sign of snowfall the plows are out on the main highways keeping them open, in spite of the severest blizzards.

Life In U. S. In 1960 Is Depicted By Traveling Christmas Show

"NO TRAFFIC delays in the city of tomorrow—but today, four out of five miles are stop and go," says recent advertising by Shell Oil Co.

For the 1937 Christmas Season, the company has co-ordinated this advertising campaign with a traveling show, which will be presented to audiences throughout the Pacific Coast as a revelation of the scientific wonders which the future will bring to American life.

From four points in its west coast marketing territory, cars of futuristic "tear drop" design were sent out early in December to make one-day stops at cities and towns. In most cases the show will be presented at schools and hospitals for the benefit of children.

After the performance, candy will be distributed to all children in the audience. It is estimated 500,000 sticks of candy will be given away by the four shows.

R. D. Stetson, division manager for the company, says of the car design:

"Flowing lines and great fins make the Shell car one of the most spectacular sights ever seen on the streets of a modern city. Automotive experts predict that this type of design will be used exclusively by 1960, when boulevards without intersections have eliminated stop-and-go driving and have speeded up traffic.

"The flowing lines will lessen wind resistance and permit cars to attain cruising speeds of more than 100 miles per hour through 'the City of Tomorrow.' The fins will stabilize the cars when traveling at this high rate."

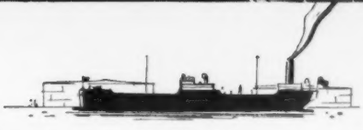
The show car is built so that the body swings open to reveal a completely equipped stage, where a company of professional entertainers will give their interpretation of how people will live in 1960.

A scientist on the stage will grow a tree before the eyes of the audience by pouring a can of concentrated climate on the seed. Ice will be made simply by breathing on water. A photograph will be taken and the picture will come fully developed and printed right out of the camera. Water will be changed into soda-pop and the soda-pop into milk by chemically rearranging the molecules of the liquids. These are some of the magician's offerings.

This traveling show has taken the place of the Christmas entertainment of former years when the company decorated certain of its owned and operated service stations in key Pacific Coast marketing areas and put on shows there. Since Shell has leased its retail outlets to independent operators it is concentrating on sales promotion work as a means of co-ordinating the merchandising efforts of these dealers.

One of the four Christmas Show cars the Shell Oil Co. is using this season along the west coast. The body swings open to reveal a completely equipped stage, on which is presented how we will live in 1960

INTERNATIONAL symbol of service



Ships that sail the seven seas come to General American Terminals. Here are world famed facilities that you can use—for extra safety in storage, extra speed in handling, extra savings. General American provides terminals for anything that flows through a pipe line. It's almost like having your own private terminal. You will save time and cut costs by using General American facilities.

"Strategically located GATX GENERAL *to serve you"*

GENERAL AMERICAN TANK STORAGE TERMINALS

A DIVISION OF GENERAL AMERICAN TRANSPORTATION CORPORATION

Goodhope, La. (Port of New Orleans)
Westwego, La. (Port of New Orleans)
Carteret, N. J. (Port of New York)
Galena Park, Tex. (Port of Houston)
Corpus Christi, Texas

Uncle Sam Takes Census Of Tourist Camps

JOHN Q. MOTORIST, with his wife and kids in the back seat and the trunk loaded with luggage, in the late afternoon begins casting about for a place to hole in for the night. Numerous signs dot the highways advertising this or that tourist camp, to lure the travel dollars from Mr. Motorist for a night's lodging and possible meals and some gasoline.

In a census of business taken by the federal bureau of census, covering the 1935 calendar year, 9848 tourist camps in this country were counted. In addition, the census showed that of 197,568 service stations, 1409 reported an incidental amount of tourist camp business. Thus, Mr. Motorist could find 11,257 places along the highways to stop, where he could secure accommodations, at least of a sort, for himself, his family and his car. This is aside from what regular hotels and so-called tourists homes offer.

By **E. L. BARRINGER**
N. P. N. Staff Writer

The 9848 camps, whose principal business was selling temporary lodgings, took in $24,300,000 from all revenue sources in 1935, or an average of $2468 per camp. The camps that were operated with a service station, while in the minority, did a much higher average volume of total business than those operated without a station. The 9848 camps on this basis offer the fol-

FIGURES in the accompanying article and table were obtained from the census of business: 1935, tourist camps, made by the Bureau of Census of the U. S. Department of Commerce. For copies of the census report write the Philadelphia branch of the census bureau.

Where The Traveler Spends His Dollars In The Nation's Tourist Camps

(Data from federal business census covering 1935, on tourist camps)

State	Tourist Camps Without Service Stations — Receipts from, in Thousands of Dollars: Number	Rentals and Meals	Merchandise Sales	Other Sources	Unsegregated Receipts	Total	Tourist Camps With Service Stations — Receipts from, in Thousands of Dollars: Number	Rentals and Meals	Merchandise Sales	Other Sources	Unsegregated Receipts	Total	State
Connecticut	35	$33	..	..	$ 2	$35	9	$16	$32	$ 1	$ 5	$54	Connecticut
Maine	207	359	$32	$3	10	404	94	124	150	12	5	291	Maine
Massachusetts	77	68	11	3	3	85	35	67	84	8	6	165	Massachusetts
New Hampshire	151	220	17	4	55	296	53	132	81	13	4	230	New Hampshire
Vermont and Rhode Island	51	35	4	6	6	51	51	91	105	14	11	221	Vermont & Rhode Island
Total New England	521	715	64	16	76	871	242	430	452	48	31	961	Total New England
New Jersey	38	41	3	2	3	49	10	8	9	5	5	27	New Jersey
New York	279	276	40	27	22	365	110	151	277	49	18	495	New York
Pennsylvania	76	75	34	31	8	148	46	47	119	23	7	196	Pennsylvania
Total Mid-Atlantic	393	392	77	60	33	562	166	206	405	77	30	718	Total Mid. Atlantic
Illinois	92	59	10	4	9	82	21	16	31	9	..	56	Illinois
Indiana	90	69	10	1	7	87	32	19	69	4	6	98	Indiana
Michigan	169	161	26	2	32	221	30	35	45	13	5	98	Michigan
Ohio	142	103	16	10	10	139	38	48	113	25	16	202	Ohio
Wisconsin	264	275	12	14	27	328	25	38	33	23	..	94	Wisconsin
Total East N. Central	757	667	74	31	85	857	146	156	291	74	27	548	Total East N. Central
Iowa	131	140	14	2	1	157	24	19	74	5	4	102	Iowa
Kansas	125	111	8	9	10	138	58	77	151	11	..	239	Kansas
Minnesota	374	243	24	29	28	324	34	38	35	9	5	87	Minnesota
Missouri	220	211	22	2	22	257	43	66	92	10	4	172	Missouri
Nebraska	107	94	14	5	2	115	29	63	126	2	15	206	Nebraska
North Dakota	9	18	1	1	..	20	4	3	27	..	..	30	North Dakota
South Dakota	69	80	12	3	1	96	5	6	25	1	..	32	South Dakota
Total W. N. Central	1035	897	95	51	64	1107	197	272	530	38	28	868	Total W. N. Central
Florida	187	331	44	19	..	394	65	59	95	8	2	164	Florida
Georgia	108	147	46	25	5	223	55	94	152	30	1	277	Georgia
Md., Del. & Dist. of Col.	48	66	24	12	17	119	19	130	77	25	2	234	Md., Del. & Dist. of Col.
North Carolina	81	84	24	13	2	123	34	39	92	20	1	152	North Carolina
South Carolina	41	82	26	11	11	130	30	38	72	4	2	116	South Carolina
Virginia	109	179	60	53	2	294	30	49	73	8	3	133	Virginia
West Virginia	26	28	..	2	4	34	7	7	16	5	..	28	West Virginia
Total South Atlantic	600	917	224	135	41	1317	240	416	577	100	11	1104	Total South Atlantic
Alabama	65	114	17	12	15	158	12	12	51	1	..	64	Alabama
Kentucky	88	84	28	17	..	129	41	45	96	23	..	164	Kentucky
Mississippi	35	35	4	..	2	41	8	11	16	10	1	38	Mississippi
Tennessee	102	177	26	18	5	226	28	37	74	19	3	133	Tennessee
Total E. S. Central	290	410	75	47	22	554	89	105	237	53	4	399	Total E. S. Central
Arkansas	145	198	29	13	12	252	48	46	73	7	12	138	Arkansas
Louisiana	48	73	2	7	..	82	16	15	22	12	..	49	Louisiana
Oklahoma	168	172	57	8	3	240	48	29	115	9	2	155	Oklahoma
Texas	840	1776	74	48	23	1921	131	226	387	7	28	648	Texas
Total W. S. Central	1201	2219	162	76	38	2495	234	316	597	35	42	990	Total W. S. Central
Arizona	244	526	54	14	6	600	64	149	266	18	15	448	Arizona
Colorado	364	444	71	17	31	563	49	84	118	1	15	218	Colorado
Idaho	98	124	18	5	2	149	30	51	115	2	12	180	Idaho
Montana	133	197	23	4	11	235	33	33	115	5	1	154	Montana
Nevada	122	280	22	3	..	305	5	21	19	3	19	62	Nevada
New Mexico	156	325	99	24	16	464	57	110	209	8	..	327	New Mexico
Utah	74	150	9	4	5	168	16	64	72	4	4	144	Utah
Wyoming	106	195	62	6	..	263	34	98	152	1	4	255	Wyoming
Total Mountain	1297	2241	358	77	71	2747	288	610	1066	42	70	1788	Total Mountain
California	1139	2552	295	103	57	3007	301	739	1080	88	37	1944	California
Oregon	314	444	64	10	6	524	72	98	181	5	4	288	Oregon
Washington	267	338	61	6	18	423	50	67	139	13	9	228	Washington
Total Pacific	1720	3334	420	119	81	3954	423	904	1400	106	50	2460	Total Pacific
TOTAL U. S.	7814	$11,792	$1,549	$612	$511	$14,464	2034	$3,415	$5,555	$573	$293	$9,836	TOTAL U. S.

WAIT!

Hold Everything!

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before you sign any Franchise Contract!

CITIES SERVICE has a proved merchandising plan that can benefit your business — boost your profits. Learn all about it before you act.

No other company in the oil industry offers the comprehensive, distinctive selling plan that Cities Service offers its dealers. That's why hundreds more have signed up with Cities Service in the last few months.

Ask to see the Cities Service PROFIT ImPROVER. All the details are there—backed by proof—designed by experts to fit your own immediate problems. And it's ready to go to work for you right now. Write, wire, telephone, or mail the coupon today to your nearest Cities Service Marketing Company.

CITIES SERVICE OIL COMPANY
Chicago, Illinois
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CITIES SERVICE OIL COMPANY, LTD.
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CITIES SERVICE OIL CO.
Tulsa, Oklahoma
ARKANSAS FUEL OIL COMPANY
Shreveport, Louisiana

MAIL THIS COUPON!

CITIES SERVICE
Room 732, 60 Wall Street, New York City

Gentlemen: Without obligation on my part, please send representative to show me the plan outlined in your PROFIT ImPROVER.

*Name*_____

*Address*_____

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RADIO CONCERTS—*every Friday at 8 P.M. (E.S.T.)* . . . WEAF *and 43 associated N. B. C. stations*

CITIES SERVICE OILS AND GASOLENES

lowing comparison:

There were 7814 camps, or 79.35 per cent of the total, with receipts of $14,464,000, or an average of $1851, operated without stations.

There were 2034 camps, or 20.65 per cent, with receipts of $9,836,000, or an average of $4836, operated with service stations.

The census was taken by enumerators who visited each identifiable place of business, to fill in a confidential report. All 48 states and the District of Columbia were covered.

Tourist camps are defined for the census as temporary places of lodging in cabins or similar structures, or in camping space furnished for a fee. The definition excludes homes taking in over-night guests, tourist camps operated by communities, and the cottage colonies seeking business from vacationists rather than tourists. The statistics do not include data on hotels.

The term receipts includes revenues from all sources, such as meals, beverages, gasoline, oil, tobacco, and so on, as well as rentals. Four classifications of receipts are given in the tables—rentals and meals, merchandise sales, other sources, and unsegregated.

Further analysis of the income of the 9848 camps shows that in camps with service stations the sale of merchandise was most important, more than 50 per cent greater than the figure for rentals and meals. In camps without service stations the rentals and meals classification was by far the most important source of income. The detailed figures are:

Source of Revenue	Camps With Stations	%	Camps Without Stations	%
Merchandise sales	$5,555,000	58.2	$1,549,000	11.1
Rentals and meals	3,415,000	35.8	11,792,000	84.5
Other sources ...	573,000	6.0	612,000	4.4
Unsegregated	293,000	3.0	511,000	3.5

Unsegregated receipts were obtained from a relatively small number of camps that reported receipts in one lump figure.

In geographic distribution four states—California, Texas, Minnesota and Colorado—account for 25 per cent of all camps with service stations and 35 per cent of all camps without stations. The east south central group in the census, Alabama, Kentucky, Mississippi, and Tennessee, turned in the smallest number of camps, 379.

Nine individual states reported a total of 300 or more camps each. California was in first place with 1440, Texas second with 941, Colorado third with 413, and Minnesota fourth with 408. Other states with 300 or more camps are New York 389, Oregon, 386, Washington 317, Arizona 308 and Maine 301.

On the basis of number of camps with service stations, California again was first with 301 and Texas second with 131. Other states having 50 or more such camps were New York 110, Maine 94, Oregon 72, Florida 65, Arizona 64, Kansas 58, New Mexico 57, Georgia 55, New Hampshire 53, Vermont-Rhode Island 51, and Washington 50.

The number of camps without service stations outranked camps with stations in most states so a comparison would be difficult, but figures from Vermont and Rhode Island were combined in one listing, and the number of camps for each classification was a tie at 51.

The 51 camps with stations reported total receipts of $221,000, or an average of $4333 per camp. The 51 camps without stations had receipts of $51,000, or an average of $1000. Average receipts for the 51 camps in each classification were:

Revenue source	Camps With Stations	Camps Without Stations
Merchandise sales	$2059	$ 78
Rentals and meals	1784	686
Other sources	274	117
Unsegregated	215	117

The table above shows that stations with camps took in on an average more money from rentals and meals alone than did the camps without stations for the same revenue classification. In addition the rentals and meals revenue of stations with camps ranked second in income production to the sale of merchandise.

That tourist camps are small business, usually one-man operations is indicated by the census figures on active proprietors and employes. The census showed that the 2034 camps with stations had 2130 active proprietors. The 7814 camps without stations had 7881 active proprietors.

Employes, full time and part time, were counted from the payroll the nearest to the fifteenth of each month. The yearly average number of employes for camps with stations was 1659, for camps without stations 4153.

An insight as to when Mr. Motorist spends his travel dollars in camps may be gained from the monthly employment figures. For camps with stations the peak month of employment is August, with July second, September third and June fourth. The low month is January.

Eloquent Verse Invites Favored Ones To Wildcat's Christmas Jinks

ON a cold grey dawn of a winter's day,
A wildcat wended his homeward way
And with stumbling footsteps he said,"Methinks
That was damn good Christmas Jinks!
I'm certainly glad I 'up and went'—
'Twas the best five bucks I ever spent!
Of course it's going to be real tough
Explaining to Mary, what kind of stuff
They mixed with oil and gasoline
To make me feel like 'sweet-sixteen'.
That show—and what went on before—
Raised my octane to ninety-four;
The dinner—well, they said it was great
Though I don't remember just what I ate.
A couple of times I fell on my face,
But aside from that I behaved with grace
And upheld the dignity which, to be frank,
Belongs with vice-presidential rank.
It may be hard for wildcats' wives
To see how oil can shape our lives;
But, take tonight—'twas an education,
A stimulus to the imagination,
A rare symposium of wit,
Blended with just a little bit
Of that which wildcats all have found
Makes the world go 'round and 'round.
In a world gone nuts with war and strife,
An industry took a lease on life,
For after last night I'm here to say
That I really believe oil's here to stay."

One of the traditions of the oil industry is the Christmas Jinks and Banquet staged in Los Angeles each Holiday season by the Wildcat Committee of the California Oil & Gas Association. Its members satire events of the past year in the oil industry. This year's Jinks takes place Dec. 17th in the Biltmore Bowl. Chairman of the committee is Frank Morgan, in charge of exploration for Richfield Oil Corp.

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IN these three COR-TEN built gasoline hauling units, five tons of dead weight have been discarded to make room for additional gallonage . . . extra payload that rides free on every haul.

Does your equipment still lug around unnecessary dead weight? Get rid of it—at lowest cost—by building with U·S·S COR-TEN.

Construction with this low-alloy, high-tensile steel—which has almost twice the strength of ordinary steel — is inexpensive, is safe, requires practically no change in shop methods. It will trim hundreds of pounds of needless weight from old-fashioned construction — and every 6¼ lbs. saved will add a full extra gallon to the load you can haul.

Here is how one prominent builder of truck tanks converts parasite poundage into profitable payload. Using U·S·S COR-TEN to replace ordinary plain steel construction—

350 gals.	increased capacity is gained on	9000 gal. tanks
300 gals.	" "	5000 gal. tanks
150 gals.	" "	3500 gal. tanks
100 gals.	" "	3000 gal. tanks

Present steel prices are highly favorable to the use of U·S·S COR-TEN. While the price of COR-TEN appears greater than that of mild steel, it is often found that the cost per gallon of capacity is no greater for COR-TEN equipment than for mild steel construction.

Take advantage of this condition. If you want extra gallonage at no extra cost, this is a practical way to get it. We will be glad to show you how COR-TEN can be most economically applied. Have you your copy of the COR-TEN book?

U·S·S HIGH TENSILE STEELS

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
COLUMBIA STEEL COMPANY, *San Francisco*
NATIONAL TUBE COMPANY, *Pittsburgh*
TENNESSEE COAL, IRON and RAILROAD COMPANY, *Birmingham*

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*

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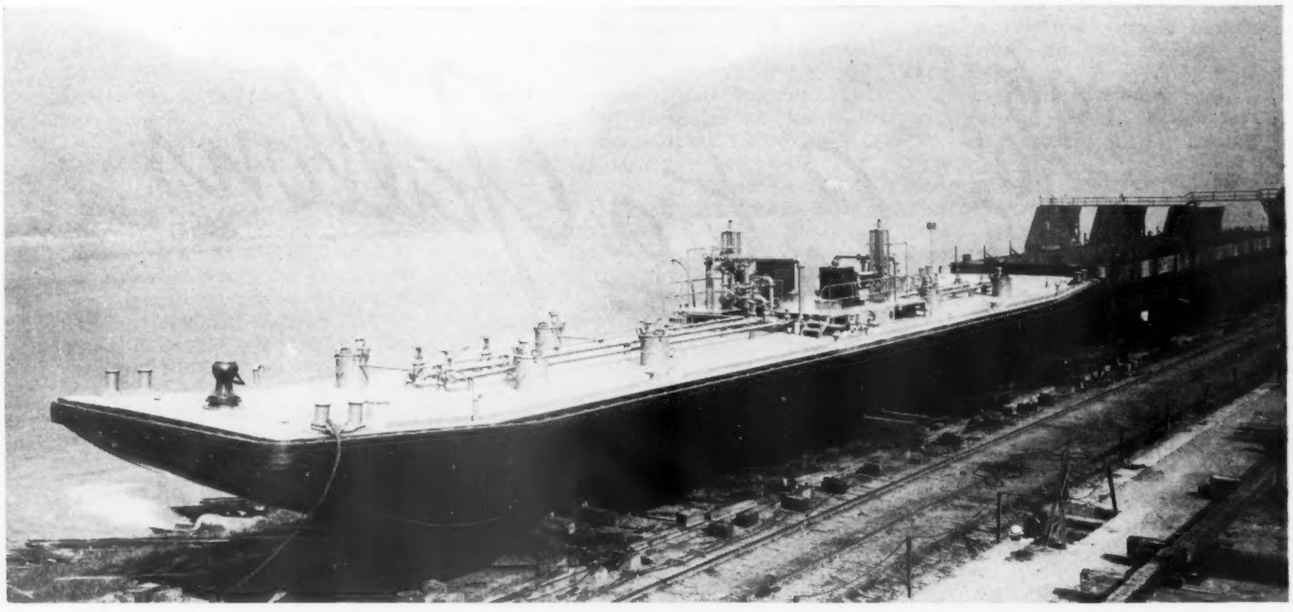
World's largest single gasoline hauling unit. Semi-Trailer, 5000 gals; 4-wheel Trailer, 4050 gals. Both tanks of U·S·S COR-TEN throughout. Built by Columbian Steel Tank Co., Kansas City, Mo.
USS

UNITED STATES STEEL



All-welded steel barge built by American Bridge Co. for Standard Oil Co. of Ohio for upper Ohio River transportation of gasoline and kerosine. The barge is divided into eight compartments and a double piping system is installed, operated by diesel pumps mounted on the barge deck

Upsetting Mark Twain Traditions With a Streamlined Barge

MODERN engineering that has streamlined trains, tapered 1938 automobiles fore and aft and made fuel oil trucks look like tear drops has reached the Ohio river through the medium of a new barge for Standard Oil Co. of Ohio.

Standard operates a towboat which is hardly an exception to the Mark Twain picturesqueness expected in river transportation, but propelled by this serviceable craft is as handsome a barge as ever fed supplies to the Ohio Valley.

Streamlining has influenced the barge's design and it is curved from deck to bottom at both ends, but for another reason than beauty. This curve improves the barge's gliding quality or, in the parlance of her crew, "She mooches nice."

Standard of Ohio supplies, via barge, gasoline and kerosine to bulk plants in Ohio River towns almost the length of the Ohio line, as formed by the river. Motor transports in turn, empty products from these river bulk plants into service stations as far as 50 miles back from the river. The barge operates the year 'round, with a normal layoff during flood periods and the like, of about one month to six weeks per year.

The previously mentioned towboat, which goes under the name "Standard", the power of a couple of diesel engines and the command of Capt. Clarence Crimmel, did well enough pushing around two 50,000-gallon barges which the company formerly operated, but when Sohio's business required three such barges, it built one modern 150,000-gallon barge, which the Standard mooches even more successfully than she propelled the other two.

The Standard and Sohio No. 3, as the barge is named, distribute about 10 loads a month, that is, 1,500,000 gallons per month, varying somewhat according to the length of the hauls. All dispatching is done from the distribution department of Standard of Ohio in Cleveland. By a careful check on bulk plant inventories Standard plans the schedule of the barge sufficiently in advance to permit this dispatching by letter. Seldom is a telegram to Capt. Crimmel necessary.

Facilitating this dispatching, is the flexibility of the barge itself, which permits carrying a variety of products and quantities of each product. Sohio No. 3 is divided into eight cargo compartments, four with a capacity of 10,000 gallons and four with a capacity of 27,500 gallons. All compartments are rectangular.

The Standard's barge during construction. The structural members shown are cross beams and not compartment walls

THE length of the four large compartments run fore and aft; the longest side of the four small compartments is the beam of the vessel. This arrangement, together with an elaborate pumping system that permits transfer from one compartment to another, facilitates keeping the barge in trim—that is, on an even keel—after dumps are made.

The pumping system consists of a double piping network with four-inch lines to four kerosine compartments, and six-inch lines to the same compartments as well as to the remaining four gasoline compartments. These lines are located at the end of the compart-

AND DO WE GIVE SERVICE!

Ask them—ask the jobbers who have come to depend on us. They've learned they can always get here just what they want when they want it. That's the whole story on our line of private-brand automotive and industrial lubricants for the jobbing trade. Isn't this the service you've been wanting? Why not find out about it!

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Some **EXCLUSIVE** *Quality Markets Open*

Since practically every motorist in the United States knows that 100% pure Pennsylvania grade motor oils lead the field, why not job the world's finest? The Freedom Oil Works Company offers four fine packaged oils that meet the most exacting specifications, yet can be sold at a price. Exclusive marketing rights available in many territories on one or all four brands. Private brands also sealed in jobbers' cans. For information write The Freedom Oil Works Company, Freedom, Pa. Pacific Coast Bulk Plant: Los Angeles, Cal.

Packed by **FREEDOM**

We wish to take this opportunity of

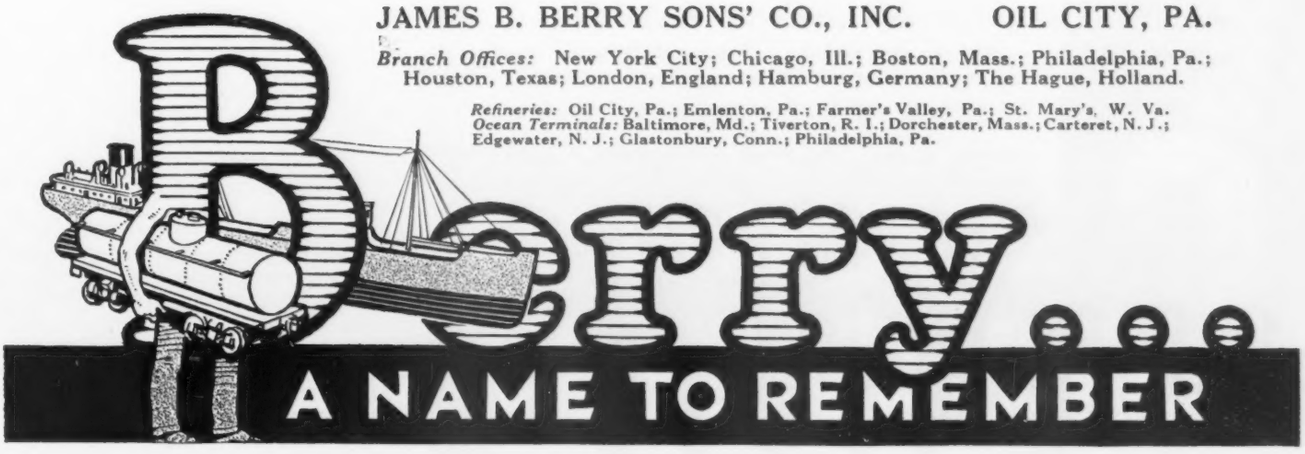
Wishing everyone a most

MERRY CHRISTMAS

JAMES B. BERRY SONS' CO., INC. OIL CITY, PA.

Branch Offices: New York City; Chicago, Ill.; Boston, Mass.; Philadelphia, Pa.; Houston, Texas; London, England; Hamburg, Germany; The Hague, Holland.

Refineries: Oil City, Pa.; Emlenton, Pa.; Farmer's Valley, Pa.; St. Mary's, W. Va.
Ocean Terminals: Baltimore, Md.; Tiverton, R. I.; Dorchester, Mass.; Carteret, N. J.; Edgewater, N. J.; Glastonbury, Conn.; Philadelphia, Pa.



IT'S A LELAND!
Here, there, everywhere . . . "It's a Leland!"
Inspect the power driven gasoline pumps on the highways and byways of the United States. Or on those of Canada . . . France . . . England. No matter where you may travel you will find that the overwhelming majority of gasoline pump motors are Lelands.
The Leland is the motor that made the power driven pump possible . . . the motor that seized the role of leader and never relinquished it. For sixteen years Leland has sold far more gasoline pump motors than can be credited to all other manufacturers combined.
Only a fraction of 1% are ever returned for service yet there are 200 fully equipped maintenance stations to serve you in emergencies. No wonder Leland commands the confidence of the gasoline pump manufacturers and major oil companies.
THE LELAND ELECTRIC CO.
DAYTON, OHIO
Canadian Address, Toronto
Cable Address, Lelect
LELAND

ments, so that on complete unloadings, the barge tips, giving practically 100 per cent drainage.

The lines are interchangeable with two pumps mounted two feet above the barge deck. One pump has a capacity of 700 gallons per minute, the other of 350 gallons per minute.

Operating the pumps are two diesel engines of 70 and 40 horsepower respectively. These engines are capable of delivering this power, although comparatively small, because of a high speed operation of 1400 revolutions per minute. Ordinarily Sohio secures the shortest possible unloading time by drawing regular grade gasoline, on which gallonage is large, with the larger pump and kerosine or premium fuel with the smaller pump. If necessary, however, the entire load can be discharged through either the large or the small pump, in the event one or the other is temporarily out of commission. This eliminates the probability of delays due to mechanical failure. The pumps likewise pump from shore to barge, as well as barge to shore, although the barge is customarily loaded by gravity.

Location of the pumps on the barge is in keeping, of course, with Department of Commerce regulations, which do not permit pumping fuels from barges through pumps located on the towboat.

Safety regulations on the Ohio River are strict, although some equipment now plying the waters operates under exception permits. No such exceptions are asked for Sohio No. 3, however, which is inspected by the American Bureau of Shipping, private inspection and classification society.

The barge, which is all-welded, was built by the American Bridge Co., Pittsburgh, and designed to meet Sohio's load requirements and at the same time be sufficiently small to enable the barge to fit in well with longer tows. It is 145 feet long, 26 feet wide and a total depth of 7 feet, 4 inches. Of this the draft is 5 feet, 10 inches and 1 foot, 6 inches freeboard.

Motor Travel At Peak In '37, API Reports

NEW YORK, Dec. 13.—Motor travel hit an all-time high in 1937, according to the American Petroleum Institute, which predicts that approximately 20,000,000,000 gallons of gasoline will be consumed by the end of the year.

The institute also states that the 30,000,000 motor vehicles now on the nation's highways travel during the year approximately 300,000,000,000 miles.

If the nation's motorists paid 1920 prices for gasoline, their 1937 motor fuel bill would be $3,000,000,000 higher than it actually will be, the institute asserts, pointing out how gasoline prices have declined during the past two decades.

It is shown that gasoline prices currently are about half of what they were in 1920, and that the average motorist, instead of paying $200 for his 1937 supply of motor fuel, is paying only $100, or about $2 a week.

Republic Oil Launches Safe Driving Club

• Attractive red, white and blue license plate emblems appearing on automobiles in Ohio, Pennsylvania, Virginia, West Virginia and North and South Carolina are the result of the Safety Club program of the Republic Oil Co., with headquarters in Pittsburgh.

The company's dealers are making

personal contacts with motorists and inviting them to become members of the Safety Club and enlisting their efforts in safe driving. As well as the license plate emblem which is put on at the station, the motorist receives a membership card which shows the adopted hand signals.

Twin Cities Oil Men Organize Club

MINNEAPOLIS, Dec. 13.—Oil company employes in the Twin Cities have organized a club to further knowledge of the technical and marketing aspects of the industry.

The Petroleum Club of the Twin Cities was organized by employes who have attended the petroleum course, given at night, by the extension division of the University of Minnesota. Marshall A. Peterson, chemist in the state highway department, is the professor.

The club meets for lunch the first Tuesday of each month and the evening of the third Friday. Petroleum education, started in the university course, is continued with lectures and motion pictures of the industry.

Professor Peterson is president of the club. Other officers are Clarence Moores, Direct Service Oil Co., Minneapolis, vice-president; Stuart G. Walker, Western Oil & Fuel Co., Minneapolis, secretary; and C. W. Eckman, H. K. Stahl Co., St. Paul, treasurer. Program committee members are Kenneth Boss, Mutual Dealers Assn., St. Paul, and Joe Mitchell, Mitchell Oil Co., St. Paul.

"Worth $10 to Me"

Said a station operator in Missouri, in telling of the practical use he had made of the Annual New Car Lubrication Number of National Petroleum News.

"The Best Help a Man can have in Selling Lubrication Jobs", *said another station operator in Cleveland.*

But It Costs Only 35 cents a Copy

• Last year, despite over 5000 extra copies of the 1937 New Car Lubrication Number ordered in advance, supplies were exhausted and reprints of its editorial features had to be republished twice.

Servicing requirements for all the New Models of all makes of cars are explained and illustrated in detail in the 1938 Edition of NATIONAL PETROLEUM NEWS New Car Lubrication Number, to be published Jan. 12.

Other Important Articles include:

- Proper lubrication of hypoid axles
- Advantages the oil company station operator enjoys in selling lubrication
- Importance of regular change of the crankcase oil
- Discussion of oil filters
- Passenger car capacity chart, showing capacities of crankcase, differential, cooling system and fuel tank, and so on.

To be sure YOUR need for extra copies of this important issue is promptly filled, send your order at once, for single copies or in lots. Price schedule on this issue is given below:

Single copies	35 cents each postpaid
10 to 100 copies	25 cents each postpaid
100 to 500 copies	23 cents each postpaid
500 to 1000 copies	21 cents each postpaid
1000 and over	20 cents each postpaid

Copies will be mailed in bulk to any address in the U. S., or to individual addresses furnished by the purchaser.

5% discount on quantities of two or more if check accompanies order. Cash must accompany orders for less than 10 copies.

(Those living in Ohio please add 3% for sales tax)

• SIGN AND MAIL TODAY •

NATIONAL PETROLEUM NEWS
563 Penton Bldg., Cleveland, O.

Date.....

• Enclosed is check for $..... Send me ..... copies of the New Car Lubrication Issue as soon as it is off the press.

Name .....

Address ..... City .....

The Accepted Standards of Pennsylvania Bright Stock Excellence Since 1900

H-M and L-M Oils Are Made Solely By

THE CONEWANGO REFINING CO.

Warren, Pa.

New Equipment

AND THE MANUFACTURERS

Windshield Service

To simplify terminology for its "vision-control" service, the Anderson Co., Gary, Ind., announces adoption of the registered trade-mark "Rain-Master" for its replacement windshield equipment, heretofore known as "Ten-Edge" wiper blades and "Five-Feature" wiper arms. The new term bears closer resemblance to other products, "Sleet-Master" and "Spot-Master" and is expected to help unify consumer recognition of the entire line.

* * *

Meter Line Described

The National Meter Co., 4207 First Av., Brooklyn, offers "a meter for every product that flows" in a new 24-page illustrated catalog featuring the Empire meter. The Hydro-Measure-Matic, a National development, is described in detail. It is an automatic, pre-determined shut-off type operated hydraulically with no mechanical connections between the meter and valve. Flow is said to be stopped slowly without slap. The Microset, a device which is said to do away with uncertain methods of compensating meters for changes in temperature or viscosity, is also described.

* * *

Photo-Chek Service

The 1938 Photo-Chek Service, issued by the Chek-Chart Corp., Chicago, will be available in January, according to the company, and will contain individual photographs of each lubrication service point on each 1938 automobile model. This year the edition is being offered to retailers as well as oil companies and automobile engineering departments.

* * *

Spark Plugs

Auto-Lite spark plugs have been adopted as standard factory equipment by Nash, Plymouth and DeSoto for 1938, it is announced by The Electric Auto-Lite Co. The company is now rushing an expansion program which will triple the output of its spark plug plant at Fostoria, Ohio.

* * *

Returns From Europe

Col. W. F. Rockwell, president of Pittsburgh Equitable Meter Co. and Merco Nordstrom Valve Co., has returned from a two months' trip in England, Belgium, France, Germany and Italy visiting companies which manufacture liquid meters, gas pressure regulators and valves under these companies' patents. He made arrangements to take over several European patents.

Col. Rockwell also inspected military trucks being manufactured for the Belgian government, in the construction of which are included many of his patents developed for the Allied forces during the war. He is an Advisory Officer of the war department's new program of motorization and mechanization of its ground forces.

* * *

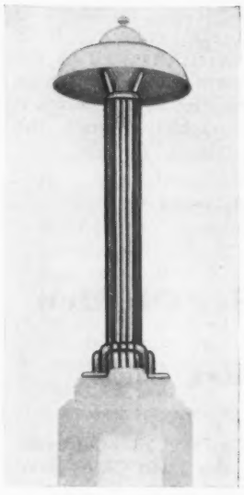
Hangars For Russia

Butler Manufacturing Co., Kansas City, has received, through the Amtorg Trading Co., New York, orders for ten steel hangars, 96 by 200 feet, for the Russian government. They are to be made without center supports or posts, each end is equipped with two 48-foot sliding doors which open up the entire end of the hangar.

* * *

Pylonite

The new Erie Pylonite, which is designed to fit any Erie Guardsman or Companion Meter pump, has just been announced by Erie Meter Systems, Inc., Erie, Pa. The company points out that this light standard can be connected to the pump already in service without any special wiring.



According to Erie, the light covers a radius of approximately 25 feet. Installed, the Pylonite is 10 feet 6 inches high. It receives a 300 to 500-watt light bulb under an 18 gauge spun aluminum 20-inch reflector. The column is on 18 gauge Bonderite steel, and the entire weight of the Pylonite as a separate unit is 30 pounds.

* * *

Synthetic Hose

A new addition to its line of hose has been announced by the Goodyear Tire & Rubber Co. This new hose is a vertical braided, lead cured, synthetic tube product with an outer cover also of synthetic rubber.

It is claimed to be highly resistant to the action of oil and gasoline, both inside and out, and is said to be well fitted as a fuel oil reel hose either for tank trucks or for servicing airplanes at airports. Static electricity is dispersed through a copper wire braided into the cord body of the house and grounded to the metal hose connections. The new hose is known as Style B H Fuel Oil-Gas hose.

New Patents

Compiled by R. E. Burnham, patent and trademark attorney, 511 Eleventh Street, N. W., Washington, D. C., from whom copies may be obtained at the rate of 25c each. State number of patent and name of inventor when ordering.

October 5, 1937

REFINING

Processes of treating hydrocarbon oils—Walter C. Craig, Los Angeles, Calif., assignor to Vapor Treating Processes, Inc., same place. Filed Jan. 21 and June 30, 1936. Nos. 2,094,585 and 2,094,586.

Method of making high viscosity index lubricating oils—Elmslie W. Gardiner, Berkeley, John W. Greene, Richmond, and Arthur L. Lyman, Berkeley, Calif., assignors to Standard Oil Co. (Calif.). Filed June 11, 1934. No. 2,094,593.

Apparatus for chemical reactions—Eugene J. Houdry, Philadelphia, Pa., assignor to Houdry Process Corp. Filed Apr. 27, 1935. No. 2,094,601.

Removal of mercaptans from hydrocarbon mixtures—William M. Malisoff and James H. Boyd, Jr., Philadelphia, Pa., assignors to Atlantic Refining Co. Filed Nov. 3, 1933. No. 2,094,612.

Process for treating mineral oils—Wilbert B. McCluer and Merrell R. Fenske, State College, Pa., assignors to Pennsylvania Petroleum Research Corp. Filed Apr. 26, 1934. No. 2,094,802.

Treatment of hydrocarbon oils—Jean D. Seguy, Chicago, Ill., assignor to Universal Oil Products Co. Filed Dec. 30, 1931. No. 2,094,907.

Method of cracking oils—Drue M. Evans, Wood River, Ill., assignor to Petroleum Conversion Corp. Filed Oct. 28, 1935. No. 2,094,980.

Process for improving tars—Walter B. Heuscher, Basel, Switzerland. Filed Oct. 18, 1934. No. 2,095,190.

MISCELLANEOUS

Greases—Maurice H. Arveson, Highland, Ind., assignor to Standard Oil Co. (Ind.). Filed May 1, 1935. No. 2,094,576.

Motor fuel—Leo P. Chebotar, Bayonne, N. J., assignor to Texas Co. Filed Nov. 6, 1930. No. 2,095,211.

October 12, 1937

REFINING

Treatment of fluids by contact masses—Arthur E. Pew, Jr., Bryn Mawr, Pa., assignor to Houdry Process Corp. Filed Apr. 8, 1936. No. 2,095,264.

Use of contact masses—John H. Pew, Ardmore, Pa., assignor to Houdry Process Corp. Filed May 27, 1935. No. 2,095,265.

Converter and its assembly—Thomas B. Prickett and Raymond C. Lassiat, Woodbury, N. J., assignors to Houdry Process Corp. Filed Mar. 4, 1935. No. 2,095,266.

Method for flash-distilling petroleum—Elliott B. McConnell, Cleveland Heights, Ohio, assignor to Standard Oil Co. (Ohio). Filed Apr. 19, 1934. No. 2,095,418.

Return bend—Frederick E. Key, St. Louis, Mo., assignor to Key Co., East St. Louis, Ill. Filed Mar. 8, 1935. No. 2,095,445.

Extraction of volatile hydrocarbons from solid or high boiling point liquid hydrocarbons—Nat H. Freeman, London, England. Filed July 22, 1936. No. 2,095,863.

MISCELLANEOUS

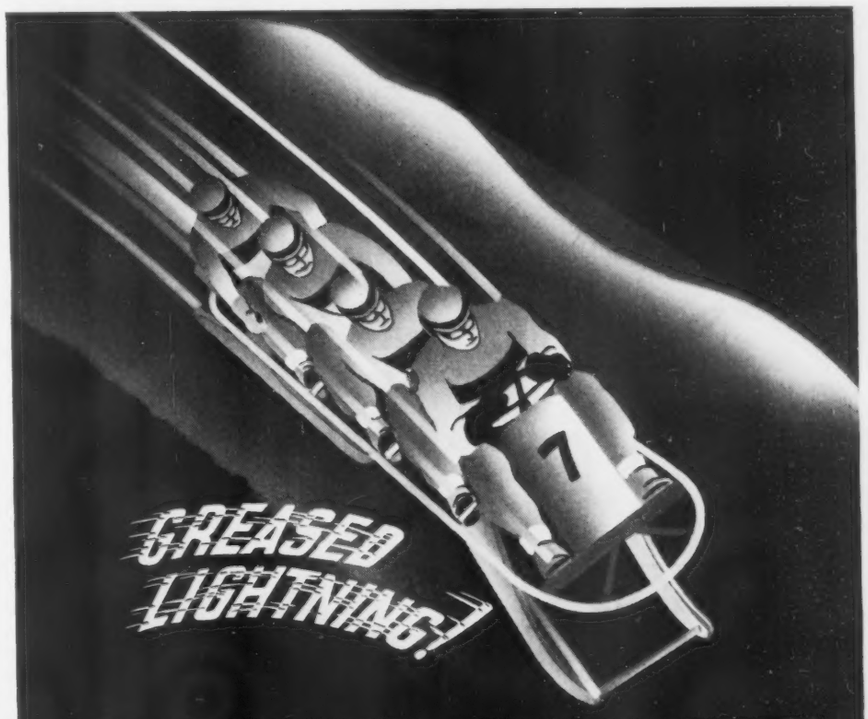
Lubricating oil composition—Arnold C. Vobach, Whiting, Ind., assignor to Sinclair Refining Co. Filed May 14, 1937. No. 2,095,538.

Builds Warehouse

TULSA, Dec. 13.—National Refining Co. has completed construction of a new warehouse, office and garage buildings at its Kansas City bulk plant. The buildings were put up on the large tract the company has occupied for the past 34 years. Its first bulk plant was in Kansas City, Kans., being established 50 years ago, but a flood in 1903 destroyed that plant and the company moved to its present site.

Acquire Terminal Site

ST. LOUIS, Dec. 13.—Final negotiation for purchase of a five-acre industrial tract on the water front here has been concluded by Socony-Vacuum Oil Co. A unique feature of the transaction was acquisition of full riparian rights giving free access to the waterline and permission to erect docks and buildings necessary in barging oil. This advantage is said to be enjoyed by few properties on the St. Louis water front.



The instant action of the graphoid surface in furnishing lubrication for friction parts might well be termed "greased lightning protection". This protection is vital during cold engine starts when, according to lubrication experts, 75% of all engine wear occurs.

With "dag" colloidal graphite in crankcase and top cylinder lubricants, the protective graphoid surface is formed on all friction parts. This durable, lubricating film "stays put" and safeguards against wear until the oil is warmed sufficiently to flow freely. Thus, all moving parts have an additional lubricant present which "takes the strain" until full film lubricating conditions are again established.

There are many excellent crankcase and upper cylinder lubricants available which contain "dag" colloidal graphite.

Ask your oil supplier today about his colloidal graphited brands. Write us for Booklet 500 which gives in non-technical language full information concerning "dag" colloidal graphite.

ACHESON COLLOIDS CORPORATION
PORT HURON, MICHIGAN

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dag

COLLOIDAL GRAPHITE

ACHESON COLLOIDS CORP., PORT HURON, MICH.
Please send gratis, story on "dag" Colloidal Graphite.

NAME .....

ADDRESS .....

From July through October this oil jobber's one-stop station in a town of 750 population, off main travel route, sold $100 worth of tires a month

Selling Tires to Truckers At One-Stop Station

THIS sign along a roadside in western Illinois above St. Louis informs motorists that Hardin lies just around the curve nestled in a narrow valley between the hills and the Illinois river. In this town, population 750, is an oil jobber marketing during the summer tire season $1000 worth of rubber each month.

The jobber, F. A. Munsterman, is a one-stop service advocate, and gives two reasons for the success of his service station business. They are, carrying a complete stock of merchandise and asking a customer to buy whenever the customer has a need that can be filled at the station.

Truck transportation means much to Calhoun county, and to Munsterman's one-stop station in Hardin, the county seat. The county is sandwiched in between the Mississippi and Illinois rivers, being about five miles wide at Hardin and 40 miles long, and without any railroads. All merchandise brought in and all farm products moved out are carried by trucks. With a population of 8000 the county has 1000 trucks and automobiles registered.

"The secret of a station's business is to continually ask the customer to buy —if you don't somebody else will," observed Munsterman. Linked with this remark was the observation that if you do not have the merchandise to sell, your customer will wander over to another service station and that station operator then has an opportunity to get his business, while you virtually made him leave your station.

Calhoun county produces much fruit, trucked to Chicago and St. Louis markets starting in July and lasting through October. These are the months when tire sales boom in the Munsterman Oil Co. station in Hardin.

The company has three tank truck drivers, three salesmen in the Hardin station, and an accountant, and "they are all salesmen" said Munsterman. Personal selling accounts for the volume. Tank truck drivers, as well as the station salesmen, are looking for trucks that are tire prospects, and then they ask the owner to buy. All truck operators are well known to the oil company men, and each salesman follows up his own tire prospects.

The used tire market also is active in the Munsterman station in Hardin. Disposing of used tires is a key to a successful tire business, Munsterman observed, along with buying right. Whenever a set of new tires is sold, his salesmen usually know where the used tires can be placed, and they start right out to sell them. Again, an intimate knowledge of truckers and their equipment comes in handy when a salesman has sold new tires and is looking for a home for the trade-ins.

MUNSTERMAN likes to keep the drives in his station clear, so customers can pull up to the gasoline pumps and into the lubrication department, but there are many trucks around the station and the station has much merchandise to sell to truckers.

Light sets are handled because every truck is required by law to carry certain lights, and every time a trucker buys a truck he is in the market for marker lights. Illinois requires two sets of lights per truck. The Munsterman station sells them, the price 89 cents a set, or $1.78 for the complete truck outfit. And with 100 sets sold a year, marker lights run into $89 in sales.

Tires on trucks go flat, just as they

N.P.N. says this is an advertisement but we say it's national petroleum news

This sparkling new, modernistic Phillips 66 station—newest of the Lunde chain in Bismarck, North Dakota—pumped 6800 gallons its first month and 7300 its second month. A "flying start" if there ever was one!

25% Ahead

And Still 2 Months to Go!

IN THE spring of 1932, Frits S. Lunde, of Huxley, Iowa, was—as he puts it—"scouting around for some job that would pay a fair dividend."

He went to North Dakota to visit a brother and to seek a location for a gasoline bulk and service station. He had often used Phillips 66 gasoline, "and believing that it was far superior gasoline than that produced by any other marketer," he decided that he could do very well for himself selling Phillips 66 to the motorists of North Dakota.

Lunde then wrote to the Phillips Petroleum Company and learned that there was no distributor for Phillips 66 products in Bismarck. He located in the Capital City, establishing a bulk plant and one service station, which opened for business on the 4th of July, 1932. In the first six months he sold 70,000 gallons of Phillips 66.

In June, 1933, Frits's brother, Alert J. Lunde, came to Bismarck. For six years he had been an instructor in the high school at Huntington, West Virginia. But once he saw how fast Phillips 66 flowed through his brother's pumps, he decided to give up school-teaching. The Lunde brothers formed a partnership and went into the retail marketing of Phillips 66 products in a bigger way. They opened their second service station in February, 1935.

On September 4th, 1937, their third station, shown above, was opened for business, equipped with the latest computing gasoline pumps, lubrication equipment, hydraulic hoist, internal motor cleaner, and complete de luxe equipment. The Orange and Black Phillips 66 shield . . . Neon lighted . . . brought in the business. And in the first ten months of 1937, the Lundes had a total gallonage of over 200,000—an increase of almost 25% over their total for the entire year of 1936.

HOW ARE YOU DOING?

Before you answer, here's a wire from Frits Lunde: "NEW STATION GALLONAGE FIRST TWENTY-FIVE DAYS NOVEMBER SIXTY-SIX HUNDRED GALLONS."

If you would like to have a booming business like the Lundes', drop us a line and tell us something about yourself. If your territory is still open, you'll get an answer in double-quick time.

Take action immediately, write, wire, or phone:

PHILLIPS PETROLEUM CO.
Bartlesville, Oklahoma
Chicago Minneapolis Peoria
Indianapolis Des Moines
Omaha St. Louis Kansas City
Wichita Tulsa Amarillo

do on passenger automobiles, and the Munsterman station is in the repair business. The charge is $1 for a truck tire, 50 cents for an auto flat, and in summer months this department brings in about $5 daily. Heavy duty boots and valves are stocked for the truck trade.

The station also carries a complete line of fan belts, and sales are sufficient to require the stock being replenished each week. Sales are made by looking at the belt, while checking the crankcase, and a frayed belt indicates a prospective customer.

Radiator hose is sold also, and while the volume is relatively small, the profit is large, and there is an opportunity to sell hose clamps.

Spark plugs are sold, and annual sales are about 800 plugs, an average of more than two plugs daily.

Tires and accessories are sold also for the passenger automobile and last summer the station sold 50 sets of seat covers to new car owners. In winter months motorists buy winter fronts, and they buy bug screens in the summer time.

All the accessory items are carried for the profit they produce in their own right, and Munsterman considers them also in the light of bringing and holding customers to a station. After all, in his opinion, a motorist or trucker needing such items is going to make the purchase. If the merchandise cannot be obtained in the Munsterman station then the customer is going to another station. So to keep motorists and truckers coming to his station for all their automotive and truck requirements he believes one-stop service is essential.

"The big thing," he said, "is to get the customer in the frame of mind to buy from you, and not to go to someone else."

To illustrate the point a customer was in the station when the remark was made, buying gasoline, and considering the purchase of a battery for his truck, two gallons of Prestone, and 16 batteries for his home lighting plant. Munsterman was working on the total sale.

Lubrication service is vital, Munsterman believes, in bringing customers to the station, and in keeping them coming back at regular intervals. And once an automobile or truck is in the station for lubrication service the station has an opportunity to sell other merchandise.

Truckers Good "Greasing" Customers

Good lubrication service is vital to truck operators out with their vehicles on the road for hire, and the Munsterman Oil Co., at Hardin, Ill., stresses this fact in selling its service to this class of vehicles, for which it gets a minimum $1 charge. Operators at this company's one-stop station watch particularly the lubrication of universal joints and wheel bearings.

Among the accessory items sold profitably at the Munsterman one-stop station are; marker lights for trucks, tire boots and valves, fan belts, radiator hose and hose clamps, spark plugs, seat covers, winter fronts and bug screens.

While lubrication service is essential for automobiles Munsterman points out that lubrication is vital to profitable truck operations. A truck makes money while wheeling over the highways and any delays or break downs halt the truck and cut off its earning capacity. Hence truck operators watch lubrication closely—especially lubrication of universal joints and wheel bearings.

The secret of lubrication Munsterman said is "a good job." Minimum charge for lubrication at the Munsterman station is $1 and, while trucks from Hardin and Calhoun county roam over the middle west, Munsterman is willing to stack his lubrication service against that sold by any other station. Trucks on the St. Louis run can take on sufficient supplies in Hardin for the round trip. Those going to Chicago have to stop, at least for gasoline, before a round trip is completed yet the Munsterman station has not lost any business to stations in Chicago or enroute when the trucker could wait until he returned to Hardin to make the purchase.

While Munsterman believes a complete stock of merchandise and the ability to sell are necessary for a station, he believes good equipment is necessary for lubrication service—necessary to do the work and when the station has correct equipment the men like to do the work.

All tire repair equipment is of the heavy duty type for truck work, and the station has a large lubrication room. Mr. Munsterman likes a pit for crankcase draining, but for lubrication work a lift. The Hardin station has an 18-foot lift, that can hoist 16,000 pounds. The entrance door is 18-feet high, and the lubrication room ceiling is 24-feet. The lift can be swung completely around.

The Munsterman Oil Co. operates also over in the next county, with a large one-stop station in Jerseyville, on the main highway to St. Louis from western Illinois. This station has truck business and also local and transient motorist trade.

The Jerseyville station, in addition to a complete line of accessories, has departments for electrical work and brakes. Brake lining sales amount to about $100 monthly, and this figure does not include labor charges for adjustments and turning down drums. The combined tire sales of the Hardin and Jerseyville stations amount to $25,000 annually.

1938 New Car Lubrication Issue

LATEST developments in hypoids . . . . wider use of oil filters . . . more batteries under the hood . . . importance of regular crankcase oil drains and chassis lubrication!

These are a few of the NEW features of the 1938 car models thoroughly discussed in our coming annual lubrication issue.

For 1938 you will want this New Car Lubrication Issue more than ever . . . to know the new features and to be prepared to service the new models when they start rolling into your station.

This annual number is 35c a copy. Our regular subscribers receive it at no extra cost on their subscription which is $2 a year, (52 issues).

If you are not a subscriber, better reserve your copy of the 1938 Lubrication Issue *now*.

— — — — — — — — CLIP AND MAIL — — — — — — — —

NATIONAL PETROLEUM NEWS
530 Penton Bldg., Cleveland, Ohio Date _____

• Reserve a copy of the 1938 New Car Lubrication Issue for me.

Enter my subscription to NATIONAL PETROLEUM NEWS for the next 52 weeks. Enclosed is check for $2. (Canada $3; Foreign $3.50).

NAME _____

St. Box _____ Position _____

City-State _____ Company _____

TRADEMARKS

The following are trade mark applications pertinent to our field pending in the United States Patent Office which have been passed for publication and are in line for early registration unless opposition is filed promptly. For further information address National Trade-Mark Company, Munsey Building, Washington, D. C., trademark specialists.

As an additional service feature to its readers, this journal gladly offers to them an advance search free of charge on any mark they may contemplate adopting or registering. You may communicate with the Editor of this Department, or send your inquiry direct to the National Trade-Mark Company, stating that you are a reader of this journal.

Pub. Nov. 23, 1937

RICHFIELD, picture of eagle and shield, HI-OCTANE, Ser. No. 334,017. Wm. C. McDuffie, as receiver of Richfield Oil Company of California, Los Angeles, Calif. Filed Jan. 17, 1933.

For Gasoline.

MIRACLO, Ser. No. 397,573. Filtrol Company of California, Los Angeles, Calif. Filed Sept. 20, 1937.

For Absorptive and Purifying Material for Treatment of Dry Cleaners' Solvents.

ROTALINE, Ser. No. 395,739. Southern Oil Company of New York, Inc., Horseheads, N. Y. Filed July 29, 1937.

For Gasoline, Kerosine, Motor Fuel Oils, Lubricating Oils and Greases.

ROYAL, on a crown, ROYAL TOOL JOINT DRESSING, Ser. No. 395,930. The Royal Manufacturing Company, Tulsa, Okla. Filed Aug. 2, 1937.

The words "Tool Joint Dressing" are disclaimed except as used in conjunction with the mark.

For Tool Joint Dressing in the Nature of a Lubricant.

HIOTANE, SOUTHPORT SUPER GASOLINE, on black and red design, Ser. No. 397,387. Southport Petroleum Company, Kilgore, Tex. Filed Sept. 13, 1937.

"Southport Super Gasoline" disclaimed apart from mark.

For Gasoline.

PERMALUBE, Ser. No. 397,742. The American Oil Company, Baltimore, Md. Filed Sept. 24, 1937.

For Lubricating Oils.

Published Nov. 30, 1937

BLUE CLUB MOTOR OIL. Ser. No. 397,277. Cities Service Oil Co., Bartlesville, Okla. Filed Sept. 10, 1937.

For lubricating oil for motors and engines.

ALUMINECK. Ser. No. 398,179. Standard Oil Company of New Jersey, Wilmington, Dela. Filed Oct. 5, 1937.

For lubricating greases.

ROL UBR I CANT. Ser. No. 398,180. Standard Oil Company of New Jersey, Wilmington, Dela. Filed Oct. 5, 1937.

For lubricating greases.

MORE PROFIT

This picture shows three Wiggins Breather Roof tanks built for the Theisen Clemens Company at St. Joseph, Mich. From left to right, they are of 20,000 bbl., 25,000 bbl., and 55,000 bbl. capacity. The company also has another 20,000 bbl. and two 55,000 bbl. tanks at this station with Wiggins Breather Roofs.

—for Oil Marketeers

LOSS caused by evaporation strikes directly at your profits. For example, stopping a loss amounting to less than half of one percent of your through-put may be the means of increasing your net earnings as much as five percent.

There is nothing mysterious about doing this either. Daily, numerous oil marketing organizations are reaping the benefits of modernization programs that have included Wiggins Breather Roofs and other Horton products.

Wiggins Breather Roofs are especially designed for standing storage tanks. When properly used, they stop all breathing loss. The amount of the savings possible through use on your tanks can best be estimated by comparison with similar existing installations. Our engineers have records covering a wide variety of conditions. Address our nearest office for information and recommendations.

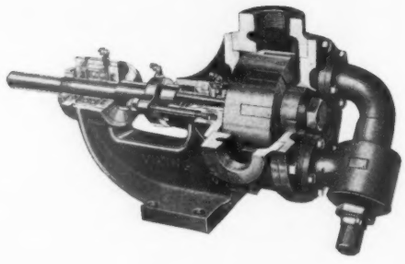
Chicago Bridge & Iron Company

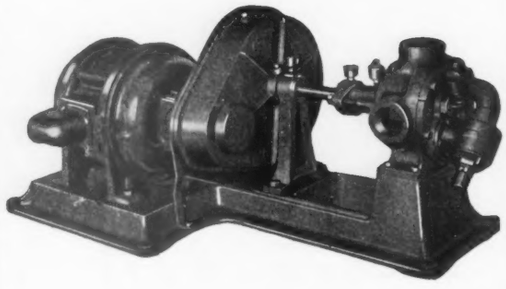
Cleveland....2206 Rockefeller Bldg.
Chicago....2125 Old Colony Bldg.
New York....3345—165 Broadway Bldg.
Philadelphia....1614—1700 Walnut Street Bldg.
Boston....1516 Consolidated Gas Bldg.
Detroit....1513 Lafayette Bldg.
Dallas....1439 Liberty Bank Bldg.
Birmingham....1534 N. Fiftieth Street
Houston....2919 Main Street
Tulsa....1607 Hunt Bldg.
San Francisco....1060 Rialto Bldg.
Los Angeles....1422 Wm. Fox Bldg.

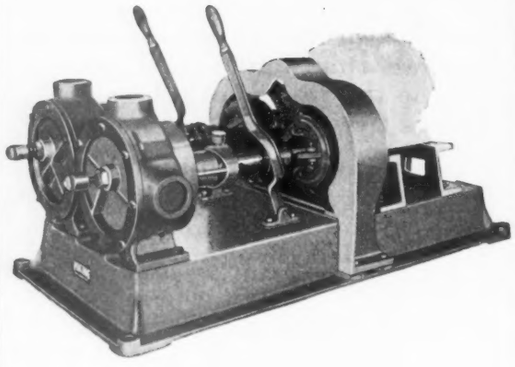
FABRICATING PLANTS in Birmingham, Chicago and Greenville, Pa.

WIGGINS BREATHER ROOFS

Your Petroleum Pumping PROBLEM MUST Have the RIGHT ANSWER!

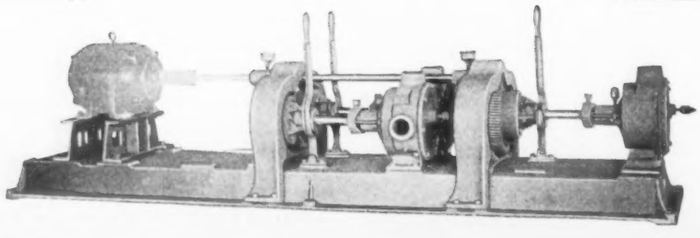






Every field of the petroleum industry has TRIED and FOUND Viking the RIGHT ANSWER. There is no greater proof of this, than the FACT, that today, more Viking Rotary Pumps are used in the numerous petroleum industries than any other make. Proof that VIKING is DEPENDABLE —proof that VIKING is EFFICIENT.

For your difficult petroleum pumping problems, we suggest that you first investigate VIKING—the pump DESIGNED and BUILT especially for handling petroleum products. Write today for illustrated bulletins displaying the entire line of Viking Rotary Pumps for the Petroleum Industry. Models are complete in both styles and sizes.



VIKING PUMP COMPANY
CEDAR FALLS, IOWA

Markets

At A Glance . . .

MID-WESTERN: Gasoline price shading persists.

MID-CONTINENT: Bright stock and South Texas oils decline.

PENNSYLVANIA: Cylinder stocks lower in dull trading.

EASTERN SEABOARD: Philadelphia gasoline down 0.5 cent.

GULF COAST: Cargo of high octane gasoline sold for export.

CALIFORNIA: Pacific foreign business still pending.

WAX: Demand light; prices generally steady.

Mid-Western

Gasoline Slow

N. P. N. News Bureau

CHICAGO, Dec. 13.—Snow and cold weather over the middle west hampered gasoline consumption the week ended Dec. 11. Offerings of all grades of gasoline were free in the Mid-Western Tank Car Market throughout the week. Shading of published prices on offerings of low and high octane grade was heard.

Open market sales were limited sellers reported. Business generally was placed, sellers said, after considerable "shopping". Volume of gasoline moving to contract accounts was off somewhat. Most sellers said the drop in this business was merely seasonal.

The situation in Michigan was somewhat the reverse of the rest of the middle west. While only a fair volume of sales was reported, curtailed refinery operations have decreased the supply available. Prices were steady.

Movement of kerosine on the refined oil freight rate was slow. However, offerings of this oil were limited. Movement of the product as fuel for range burners, moving on the fuel oil freight rate, increased considerably.

Range oil was steady at a minimum of 4 cents.

Mid-Continent

Bright Stock Down 1 Cent

N. P. N. News Bureau

TULSA, Dec. 13.—Prices for Mid-Continent and South Texas lubricating oils were reduced early last week as refiners reported competition from other manufacturing districts was cutting into volume of business. Mid-Continent bright stock prices dropped 1 cent, while South Texas lube quotations were cut 0.5 cent by some sellers. Neutral oil prices remained unchanged.

Cold weather throughout the Mid-Continent last week sent natural gasoline production up at some plants. Increased offerings disturbed the balance between supply and demand, and some sellers reduced Grade 26-70 prices 0.25 cent. Lower prices were attracting more jobber interest, they said.

East Texas gasoline stocks remained large as coastwise and export demand continued light. Reports indicated storage tanks at the Gulf were full of gasoline sold, but on which lifting had been postponed. At least one Gulf buyer indicated further East Texas purchases would be delayed until these stocks are depleted.

Gasoline prices generally were unchanged in other districts. Refiners said they were limiting shipments to contract and local accounts.

Kerosine prices were steadier. One or two refiners were offering to pay 4 cents Group 3 for 41-43. Sellers continued to quote jobbers 4 to 4.25 cents.

N. P. N. Refinery Index

The Refinery Index shown below is the calculated average return from refining a barrel of 36 gravity Mid-Continent crude into its various principal products at the current price of crude oil. The index indicates the following margins in cents per barrel between cost of crude and current selling price of products.

Date	Margin
Nov. 1	39.8
Month ago	44.8
Year ago	55.0

N.P.N. Gasoline Index

	Dealer T.w. Cents	Tank Car per gal.
Dec. 13	10.29	6.06
Month ago	10.32	6.29
Year ago	10.16	6.31

Dealer index is an average of "undivided" dealer prices, ex-tax, in 50 cities.

Tank car index is a weighted average of 13 wholesale markets for regular-grade gasoline.

Pennsylvania

Bright and Dark Stocks Lower

N. P. N. News Bureau

CLEVELAND, Dec. 13.—Bright and dark cylinder stocks were offered at lower prices in the western Pennsylvania refinery market last week. U. S. Motor gasoline also sold down 0.125 cent in the lower field. Other light products and neutral oils were steady.

Two refiners reported slightly better demand for dark cylinder stocks but reports of all other refiners and brokers indicated continued lack of buying interest. Two refiners offered all grades 0.5 to 2 cents a gallon lower. The 25 pour test bright stock was offered at 15 cents, down 1 cent, by three refiners.

Demand for gasoline was slow, most sellers reported. Competition from Michigan was diminishing but from other areas it was keener, they said. While ordinary U. S. Motor sold at lower prices in the lower field, the 65 octane appeared to be fairly steady. This was due mainly, sellers said, to a shortage of benzol.

Brokers reported kerosine was offered a bit more freely but several refiners said they were still behind on shipments. Prices were steady.

A 5-car sale of fuel oil was reported at 5 cents in the lower field and several small-lot sales were made at 4.875 cents, up 0.125 cent from the previous minimum.

Wax was offered more freely and demand was light.

Eastern

Gasoline Sluggish

N. P. N. News Bureau

NEW YORK, Dec. 13.—Open tank gasoline markets were reported sluggish at eastern seaboard terminals the past week. Shipments against contracts were fairly heavy for the season, sellers said.

The only major reduction in tank wagon markets reported during the week was at Philadelphia, where prices to dealers were reduced 0.5 cent. This brought delivered prices for regular "branded" gasoline to undivided dealers to 7.75 cents, exclusive of taxes. Atlantic Refining Co., in its reduction on Dec. 9 said it was "meeting competition". Service station prices at Phila-

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). Prices in cents per gallon, except heavy fuel oils in dollars per barrel, tank car lots, f.o.b. refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included, unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Gasoline *and* Naphtha

Prices Effective	Dec. 13	Dec. 6
OKLAHOMA		
U. S. Motor: (a) (Octane Test L-3)		
62 oct. & below	4.00 – 4.375	4.125– 4.375
63-66 oct.	4.375– 4.75	4.50 – 4.75
67-69 oct.	4.75 – 5.125	4.875– 5.125
70-72 oct.	5.00 – 5.375	5.125– 5.50
60-62, 400 e.p.	*4.00 – 4.375	*4.125– 4.375
64-66, 375 e.p.	*5.00 – 5.125	*5.00 – 5.125
68-70, 350-360 e.p.	*5.25	*5.25
WESTERN PENNA.		
Bradford-Warren:		
Motor gasoline:		
U.S. Motor (58-62°)	.....	.....
Min. 65 oct.	7.25 – 7.50	7.25 – 7.50
64-66, 390 e.p.	.....	.....
Other districts:		
54-56 naphtha	4.875– 5.00	4.875– 5.00
Motor gasoline:		
U. S. Motor (58-62°)	4.875– 5.00	4.875– 5.125
Min. 65 oct.	7.00 – 7.50	7.00 – 7.50
64-66, 390 e.p.	*5.50	*5.50
CENTRAL MICHIGAN (Prices f.o.b. Cent. Mich. refinery group basis, for shipment within Michigan. Shipments, however, may originate at plants outside Central group).		
Str.-Run Gasoline	*5.25 – 5.50	*5.25 – 5.50
64-66 octane gas	7.75 – 8.00	7.75 – 8.00
68-70 octane gas	8.125– 8.50	8.125– 8.50
*Excluding Detroit shipment.		
CALIFORNIA (3c tax to be added to prices if used in state)		
U. S. Motor:		
54-58, for instate shipment	7.75 – 9.25	8.00 – 9.25
54-58, for outside state shipment	8.50 – 9.00	8.50 – 9.00
58-61, 375-400 e.p., 65 oct. & above	8.75 – 9.75	8.75 – 9.75
†**N. TEX.** (For shipment to Texas and N. Mex. destinations; Group 3 prices quoted on northern shipments). U. S. Motor: (a) (Octane Test L-3)		
62 oct. & below	*4.50 – 4.875	*4.50 – 4.875
63-66 oct.	*5.00 – 5.375	*5.00 – 5.375
67-69 oct.	*5.375– 5.75	*5.375– 5.75
70-72 oct.	*5.625– 6.00	*5.625– 6.00
60-62, 400 e.p.	*4.625– 4.875	*4.625– 4.875
KANSAS (For Kansas destinations only)		
U. S. Motor: (a) (Octane Test L-3)		
62 oct. & below	4.375– 4.625	4.50 – 4.75
63-66 oct	9.85	5.00 – 5.375
67-69 oct.	9.85	5.375– 5.625
70-72 oct.	5.375– 5.625	5.625– 5.875
†**W. TEX.**		
U. S. Motor: (a) (Octane Test L-3)		
62 oct. & below	4.625– 4.75	4.625– 4.75
63-66 oct.	5.125– 5.25	5.125– 5.25
67-69 oct.	5.50 – 5.625	5.50 – 5.625
70-72 oct.	5.875	5.875
†**E. TEX.**		
60-62, 400 e.p.	*4.25	*4.25 – 4.375
N. LA. (For shipment within La. & into Ark.)		
U. S. Motor: (a) (Octane Test L-3)		
62 oct. & below	4.75 – 5.00	4.75 – 5.00
63-66 oct.	5.00 – 5.25	5.00 – 5.25
67-69 oct.	5.25 – 5.50	5.25 – 5.50
70-72 oct.	5.75 – 5.875	5.75 – 5.875
ARKANSAS (For shipment within Ark. & into La.)		
U. S. Motor: (a) (Octane Test L-3)		
62 octane & below	4.75	4.75
67-69 oct.	5.50	5.50
OHIO (Quotations of S. O. Ohio. Delivered anywhere in Ohio).		
U. S. Motor	7.875	8.00
Above 65 oct.	8.125	8.25

Natural Gasoline

(Prices are those to blenders on freight basis shown below. Shipments, however, may originate in other Mid-Continent manufacturing districts, such as Panhandle Texas, S. W. Texas or Kans.)

Prices Effective	Dec. 13	Dec. 6
F.O.B. GROUP 3		
Grade 26-70	3.50	3.75

*Nominal.
‡Only one refiner quoting.
†Refiners report they generally receive from 0.25c to 0.5c per gal. more for gasoline & kerosine for local or differential territory shipment.

Prices Effective	Dec. 13	Dec. 6
Natural Gasoline (Cont'd)		
F.O.B. BRECKENRIDGE		
*Grade 26-70	3.50	3.75
CALIFORNIA (F.o.b. plants in Los Angeles basin)		
75-85, 350-375 e.p. for blending	7.50 – 7.75	7.50 – 7.75

Kerosine

WESTERN PENNA.		
Bradford-Warren:		
45 w.w.	5.50 – 5.75	5.50 – 5.75
46 w.w.	5.625– 5.875	5.625– 5.875
47 w.w.	5.75 – 6.00	5.75 – 6.00
Other districts:		
45 w.w.	5.375– 5.50	5.375– 5.50
46 w.w.	5.50 – 5.625	5.50 – 5.625
47 w.w.	5.625– 5.75	5.625– 5.75
CENTRAL MICHIGAN (Prices f.o.b. Cent. Mich. refinery group basis, for shipment within Michigan. Shipments, however, may originate at plants outside Central group.)		
47-49 w.w.	5.30 – 5.55	5.30 – 5.55
OKLAHOMA		
41-43	4.00 – 4.25	4.00 – 4.25
42-44 w.w.	4.125– 4.375	4.125– 4.375
KANSAS (For Kansas destinations only).		
41-43 w.w.	4.375– 4.50	4.375– 4.50
42-44 w.w.	4.50 – 4.625	4.50 – 4.625
†**N. TEX.** (For shipment to Texas and New Mexico destinations; Group 3 prices quoted on northern shipments).		
41-43 w.w.	4.25 – 4.375	4.25 – 4.375
†**E. TEX.**		
41-43 w.w.	*4.00 – 4.125	*4.00
N. LA. (For shipment within La. and into Ark.).		
41-43 w.w.	4.50	4.50
ARK. (For shipment within Ark. and into La.).		
41-43 w.w.	‡4.50	‡4.50
CALIFORNIA		
40-43 w.w.	6.00 – 7.00	6.00 – 7.00

Gas *and* Fuel Oils

WESTERN PENNA.		
Bradford-Warren:		
36-40	5.125– 5.25	5.125– 5.25
Other districts: (Excluding Pittsburgh District Prices).		
36-40	4.875– 5.00	4.875
CENTRAL MICHIGAN (Prices f.o.b. Cent. Mich. refinery group basis, for shipment within Michigan. Shipments, however, may originate at plants outside Central group.		
P.W. Distillate	5.00 – 5.25	5.00 – 5.25
No. 3 gas oil, str.	4.75 – 5.00	4.625– 4.75
U.G.I. gas oil	4.625– 4.75	4.50 – 4.75
Fuel Oils (Vis. at 100):		
500-700 Vis.	2.50 – 3.00	2.50 – 3.00
300-500 Vis.	2.75 – 3.25	2.75 – 3.25
100-300 Vis.	3.00 – 3.50	3.00 – 3.50
OKLAHOMA		
No. 1 white	4.00 – 4.125	4.00 – 4.125
No. 1 straw	3.875– 4.00	3.875– 4.00
No. 2 straw	3.75 – 3.875	3.75 – 3.875
No. 2 dark	3.625– 3.75	3.625– 3.75
U. G. I. gas oil	*3.00 – 3.375	*3.00 – 3.375
28-30 zero	*3.50 – 3.75	*3.50 – 3.75
28-30	‡$1.35	‡$1.35
24-26	‡$0.875–$0.925	‡$0.875–$0.925
18-22	*$0.825–$0.875	*$0.825–$0.875
14-16	*$0.80 –$0.85	*$0.80 –$0.85
KANSAS (For Kans. destinations only).		
No. 1 p.w. fuel oil	4.25 – 4.50	4.125– 4.25
10-14 fuel oil	$0.70 –$0.725	$0.725–$0.775
N. TEX. (For shipment to Texas and N. Mex.; Group 3 prices quoted on northern shipments).		
No. 1 white	*4.125	*4.125
U. G. I. gas oil	2.75 – 2.875	2.75 – 2.875
24-26	$0.85 –$0.875	$0.85 –$0.875
18-22	$0.80 –$0.825	$0.80 –$0.825
N. LA. (For shipment within La. and into Ark.).		
No. 2	3.50 – 3.625	3.50 – 3.625
20-24	$1.10 –$1.15	$1.10 –$1.15
16-20	$0.95 –$1.00	$0.95 –$1.00
10-14	$0.80 –$0.85	$0.80 –$0.85
ARK. (For shipment within Ark. and into La.).		
No. 2	‡3.875	‡3.875
28-30 gas oil, zero	‡3.625	‡3.625
CALIFORNIA		
San Joaquin Valley:		
Heavy fuel	$0.60 –$1.00	$0.60 –$1.00
Light fuel	$0.85 –$1.10	$0.85 –$1.10
Diesel fuel (per gal.)	3.75 – 5.00	3.75 – 5.00
Stove dist. (per gal.)	4.25 – 7.00	4.25 – 7.00
Los Angeles:		
Heavy fuel	$0.65 –$1.10	$0.65 –$1.10
Light fuel	$0.90 –$1.20	$0.90 –$1.20
Diesel fuel (per gal.)	3.50 – 5.00	3.50 – 5.00
Stove dist. (per gal.)	4.00 – 7.00	4.00 – 7.00

Prices Effective	Dec. 13	Dec. 6
Gas and Fuel Oils (Cont'd		
San Francisco:		
Heavy fuel	$1.15	$1.15
Light fuel	$1.25	$1.25
Diesel fuel (per gal.)	5.50	5.50
Stove dist. (per gal.)	7.50	7.50

Note: All above heavy fuels meet Pacific specification 400; light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Neutral Oils

WESTERN PENNA.

Viscous Neutrals (Viscosity at 70° F.)

200 Vis. (180 at 100°) No. 3 col., 420-425 fl.:		
0 p.t.	22.00 –22.50	22.00 –22.50
10 p.t.	21.00 –21.50	21.00 –21.50
15 p.t.	20.50 –21.00	20.50 –21.00
25 p.t.	18.50 –19.00	18.50 –19.00
180 Vis. (165 at 100) No. 3 col., 410-415 fl.:		
25 p.t.	17.50 –18.00	19.00 –19.50
150 Vis. (143 at 100) No. 3 col., 400-405 fl.:		
0 p.t.	19.00 –19.50	19.00 –19.50
10 p.t.	18.00 –18.50	18.00 –18.50
15 p.t.	17.50 –18.00	17.50 –18.00
25 p.t.	16.50 –17.00	16.50 –17.00

SOUTH TEXAS

Vis. Color		
Pale Oils: (*Vis. at 100° F.; p.t. 0*)		
100 No. 1½-2½	5.00 – 5.50	4.75 – 5.50
200 No. 2-3	6.75 – 7.25	6.75 – 7.25
300 No. 2-3	7.25 – 7.75	7.25 – 7.75
500 No. 2½-3½	8.25 – 8.75	8.25 – 8.75
750 No. 3-4	8.75 – 9.25	8.75 – 9.25
1200 No. 3-4	9.25 – 9.75	9.25 – 9.75
2000 No. 4	9.50 –10.00	9.50 –10.00
Red Oils:		
200 No. 5-6	6.75 – 7.25	6.75 – 7.25
300 No. 5-6	7.25 – 7.75	7.25 – 7.75
500 No. 5-6	8.25 – 8.75	8.25 – 8.75
750 No. 5-6	8.75 – 9.25	8.75 – 9.25
1200 No. 5-6	9.25 – 9.75	9.25 – 9.75
2000 No. 5-6	9.50 –10.00	9.50 –10.00

Note: South Texas red oil prices shown above cover oils with green cast; blue cast red oils are slightly lower in some cases.

MID-CONTINENT (Vis. at 100° F.; F.o.b. Tulsa basis).

(0 to 10 P.P.)

Vis. Color		
Pale Oils:		
60-85—No. 2	5.50	5.50
86-110—No. 2	6.00	6.00
150—No. 3	9.00	9.00
180—No. 3	10.00	10.00
200—No. 3	10.50	10.50
250—No. 3	11.50	11.50
280—No. 3	12.50	12.50
300—No. 3	13.00	13.00
Red Oils:		
180—No. 5	9.00	9.00
200—No. 5	9.50	9.50
250—No. 5	10.50	10.50
280—No. 5	11.50	11.50
300—No. 5	11.75	11.75

Note: Viscous oils, 15-25 p.p., generally are quoted 0.5c under 0-10 p.p. oils. Non-viscous oils, 15-25 p.p., generally are quoted 0.25c under 0-10 p.p. oils. Viscous oils (150-300 vis.), No. 4 color, generally are quoted 0.5c above No. 5 color oils.

CHICAGO (Vis. at 100° F.)

Pale Oils **0 to 10 p.p.:

Vis. Color		
60-85—No. 2	7.25	7.25
86-110—No. 2	7.75	7.75
150—No. 3	10.00	10.00
180—No. 3	11.00	11.00
200—No. 3	11.50	11.50
250—No. 3	12.50	12.50
Red Oils:		
180—No. 5	10.00	10.00
200—No. 5	10.50	10.50
250—No. 5	11.50	11.50
280—No. 5	12.50	12.50
300—No. 5	12.75	12.75

**Viscous oils, 15 to 30 p.p. are quoted 0.5c lower, 60-85 and 86-110 No. 2 non-viscous oils, 15 to 30 p.p., are quoted 0.25c lower. To obtain delivered prices in Chicago, add 0.25c per gal.

Cylinder Stocks

MID-CONTINENT (F.o.b. Tulsa basis).

Bright Stocks:		
190-200 Vis. at 210° D	19.00	20.00
150-160 Vis. at 210° D:		
0 to 10 p.p.	16.00	17.00
10 to 25 p.p.	15.00	16.00
25 to 40 p.p.	15.00	16.00
150-160 vis. at 210° E	15.00	16.00

SWING INTO LINE WITH MARATHON LUBRICANTS

Don't sell YOUR customers just any lubricant that is advertised to fill all gear needs.. be sure that it is a lubricant that will suit their particular need. There is a complete line of Marathon lubricants and one especially adapted for each lubrication problem whether it is automotive, industrial or agricultural.

Write, wire or phone for the complete particulars. There are still exclusive territory franchises available to aggressive dealers.

MARATHON PRODUCTS
BEST IN THE LONG RUN

LINCO

THE OHIO OIL COMPANY

GENERAL OFFICES - - - FINDLAY, OHIO

ROBINSON, ILLINOIS TULSA, OKLAHOMA FT. WORTH, TEXAS

delphia were reported ranging from 8.9 cents to 10.9 cents, exclusive of taxes, prior to the tank wagon cuts.

Tank car prices were reduced 0.25 cent for open, spot market shipment by some suppliers at Savannah and Jacksonville. One supplier said he had been losing business on gasoline for shipment from Savannah to gasoline moving into Georgia from western points.

Another supplier reported a little "shading" of the 7.5-cent tank car price for open market shipment from Norfolk and Wilmington, while others said they believed prices were fairly steady at these points.

Coastal

Cargo of Gasoline Sold

N. P. N. News Bureau

NEW YORK, Dec. 13.—Reports were heard during the week ended Dec. 11 that several cargoes of gasoline had been sold for shipment from the Gulf Coast, but only one sale was confirmed. This involved a full cargo of 60-62, 400 e.p. gasoline, 67 octane rating, for export lifting early in January at 5.625 cents, f.o.b. the Gulf.

Low octane grades of 400 or lower end point gasoline were reported available for export shipment at 5.25 to 5.375 cents. The unconfirmed reports of sales generally involved these grades. French buyers were reported to have purchased three or four cargoes of East Texas crude at 16 cents a barrel over the field price for cargo shipment from the Gulf. Some traders reported that the crude oil situation appeared tighter, due mostly to the Sunday shutdown in East Texas.

Export demand for Mid-Continent and South Texas lubricating oils was reported only fair. Several New York buyers and suppliers reported that Mid-Continent 150-160 vis. D 210 bright stock, zero to 10 pour point, was available at 13.5 to 14 cents, f.o.b. Gulf, for bulk export shipment.

Light fuel oils and kerosine were quiet.

California

Foreign Inquiries Still Pending

N. P. N. News Bureau

LOS ANGELES, Dec. 11.—Inquiries for bulk U. S. Motor gasoline, reported on the west coast a week ago, were still in the formative stages, although one supplier said bids on two cargoes for Pacific foreign delivery were very much alive.

Quotations on gasolines for quantity movement remained unchanged, but there was some indication that the lows of the various spreads, rather than the highs, would prevail on any spot sales at this time.

Suppliers indicated some difference of opinion as to the value of these products and this schism extended

(*Continued on page* 68)

Fuel Oil . . . . .

CHICAGO, Dec. 13.—The ends of the fuel oil list in Mid-Western and Michigan markets were in distinctly different positions the week ended Dec. 11. Light fuel was moving well. Inquiries were heavy. Prices were steady. Heavy fuels were inactive. Inquiries were few. Prices were easy.

Cold weather over the middle west stimulated demand for burning oils. Offerings of Nos. 1, 2 and 3 oils were limited.

An oversupply of industrial fuel was reported at all Michigan and most mid-western plants. In the former area, lack of storage facilities has caused many plants to curtail crude runs. Demand from Michigan and Ohio industrial users was virtually at a standstill, refiners said.

* * *

NEW YORK, Dec. 13.—The cold wave which covered the eastern seaboard the past week, bringing subnormal temperatures to the southern sections and normal winter weather to the northern portions, proved a boon to distributors of light fuel oils and range fuels.

Unsettled markets were reported in a few districts, but, generally speaking, traders reported that prices were steady and movement was satisfactory. A continuation of present weather conditions from Baltimore north along the seaboaord will give fuel oils heavy enough movement to prevent any "backing up" in storage, several traders said.

* * *

TULSA, Dec. 13.—Zero weather in the Mid-Continent marketing territory last week stimulated demand for light fuels. Persistent inquiries from northern distributors and brokers brought out a few more supplies.

One broker inquired for 100 cars of No. 1 p.w. oil, but was able to obtain only 50 cars at 4 cents. It was reported this broker was obtaining 4.125 cents, Group 3, from distributors and jobbers. This grade was still available at 4 cents from some sellers, however. No. 2 and 3 oils were more closely held than No. 1.

Despite some relief through increased takings by railroads, heavy fuel oil was sluggish in most Mid-Continent districts.

Pa. Refinery Lubricating Oil Inventory

(Issued as of Dec. 2 by National Petroleum Assoc.)

	Gallons
1. **Raw Long Residuum** (Including all raw long residuum below, and not salable, as 600 fire)	1,040,713
2. **600 Steam Refined** (Includes all steam refined stock commonly sold or used as 600 and as raw material for bright stocks)	9,449,470
3. **Other Steam Refined** (Not included in 1 and 2, above)	5,675,483
4. **Finished Dewaxed Long Res.**	3,096,831
5. **Bright Stock** (Does not include any material reported in 4, above)	15,672,644
6. **Viscous Neutral,** below 180 vis. but not below 142 vis. @ 100	6,677,711
7. **Viscous Neutral,** 180 vis. @ 100 and above	9,191,092

TANK WAGON MARKETS, HEATING OILS

Prices in Effect Dec. 13, 1937

Following are tank wagon prices of various grades of heating oil at the points shown in various territories Prices are in cents per gallon.

	No. 1	No. 2	No. 3	No. 4
S. O. NEW JERSEY				
Newark, N. J.	*	7.00	7.00	7.00
Atlantic City, N. J.	*	7.00	7.00	7.00
Baltimore, Md.	8.00	7.00	7.00	7.00
Washington, D. C.	8.50	7.75	7.75	7.75
SOCONY-VACUUM OIL CO. INC. (S. O. New York Division)				
New York City	*	7.50	7.50	7.50
Albany, N. Y.	*	7.50	7.50	7.50
Rochester, N. Y.	*	7.50	7.50	7.50
Boston, Mass.	*	7.00	7.00	7.00
Bangor, Me.	*	8.00	8.00	8.00
Manchester, N. H.	*	8.00	8.00	8.00
Burlington, Vt.	*	8.00	8.00	8.00
Hartford, Conn.	*	7.00	7.00	7.00
New Haven, Conn.	*	7.00	7.00	7.00
Providence, R. I.	*	7	7	7

*Prices for No. 1 fuel in S. O. New Jersey and Socony-Vacuum territories same as for kerosine which see in tank wagon table for various cities; prices change with kerosine.

	No. 1	No. 2	No. 3	No. 4
ATLANTIC REFINING				
Philadelphia, Pa.	7.75	7.00	7.00	7.00
Allentown, Pa.	8.25	7.50	7.50	7.50
Wilmington, Del.	8.25	7.50	7.50	7.50
Springfield, Mass.	9.00	7.50	....	7.50
Worcester, Mass.	9.00	7.50	....	7.50
Hartford, Conn.	9.00	7.50	....	7.50

S. O. OHIO

*Ohio Statewide	8.00	8.00	7.50	6.75

Note: S. O. Ohio prices are for hose dumps, bucket dumps are 0.5c per gallon higher.

*Except Cleveland Division and City of Toledo. In Cleveland Division (Cuyahoga, Lake and Geauga counties), No. 1 price is same as statewide; Nos. 2, 3 and 4 are 0.5c higher; No. 5 is priced 0.25c lower than No. 4. In Toledo No. 2 is 0.5c lower than statewide, others same.

S. O. INDIANA

Stanolex Fuel and Furnace Oils

	No. 1 Fuel	Stanolex Furnace
Chicago	†8.8	7.00
Indianapolis	...	*11.8
Detroit	...	7.1
Milwaukee	8.1	7.4
Minneapolis	7.5	7.5
Sioux City	7.2	7.2
St. Louis	7.5	6.8
Kansas City	6.6	6.6

*Includes state tax of 4c.

†This price applies to 1 to 99 gals. deliveries; 150 gals. and over, 7c.

Note: Small-lot deliveries of light fuel oils range up to 2c higher than above quotations.

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days) unless otherwise stated. Prices in cents per gallon, except heavy fuel oils in dollars per barrel, tank car lots, f.o.b. refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included, unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M. D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Cylinder Stocks (cont'd)

Prices Effective	Dec. 13	Dec. 6
Mid-Continent (cont'd)		
120 Vis. at 210° D:		
0 to 10 p.p.	15.00	16.00
10 to 25 p.p.	14.50	15.50
25 to 40 p.p.	14.125	15.125
600 S.R. Dark Green	5.00 – 7.50	5.00 – 7.50
600 S.R. Olive Green	7.00 – 9.50	7.00 – 9.50
631 S.R.	‡13.50	‡14.00
Black Oil	3.50 – 4.00	3.50 – 4.00
CHICAGO (Viscosity at 210°)		
Unfiltered Steam Refined:		
140	9.00	9.00
160	10.00	10.00
200	11.00	11.00
Bright stocks, 160 vis. at 210. No. 8 color:		
0 to 10 p.p.	18.75	18.75
15 to 25 p.p.	17.75	17.75
30 to 40 p.p.	17.25	17.25
E filtered Cyl. Stock	14.50	14.50

To obtain prices delivered in Chicago, add 0.25c per gal.

‡Only one refiner quoting.

Prices Effective	Dec. 13	Dec. 6
***WESTERN PENNA.**		
600 S.R. filterable	7.50 – 8.00	8.00 – 8.50
650 S.R.	10.50 –11.50	11.50 –12.00
600 fl.	11.00 –12.00	12.00 –12.50
630 fl.	14.00 –16.00	16.00 –16.50
600 Warren E	13.00 –13.50	13.00 –13.50

*Quotations only.

Bright stock, 145-155 vis. at 210°, 540-550 flash, No. 8 color:

10 p.t.	19.00 –19.50	19.00 –19.50
15 p.t.	18.00 –18.50	18.00 –18.50
20 p.t.	17.00 –17.50	17.00 –17.50
25 p.t.	15.00 –16.00	16.00 –16.50

Petrolatums

WESTERN PENNA. (Per lb., in barrels, carload lots. In tank cars, 0.5c per lb. less).

Snow white	6.625– 6.75	6.625– 6.75
Lily White	5.625– 5.75	5.625– 5.75
Cream White	4.625– 4.75	4.625– 4.75
Light Amber	2.75 – 2.875	2.75 – 2.875
Amber	2.50 – 2.625	2.50 – 2.625
Red	2.125– 2.375	2.125– 2.375

Wax

Prices Effective	Dec. 13	Dec. 6
WESTERN PENNA. (Per lb., f.o.b.		
122-124 w.c. scale, A.m.p.	2.95	2.95 – 3.00
124-126 w.c. scale, A.m.p.	2.95	2.95 – 3.00
OKLAHOMA (Per lb. in bbls.; in a few instances, per lb. in burlap bags).		
124-126 w.c. scale, A.m.p.	3.00	3.00

CHICAGO (In bags, carload lots. Melting points are E.M.P. (A.S.T.M.) methods; add 3° F. to convert into A.m.p.)

Fully refined:

122-124	4.65 – 4.75	4.65 – 4.75
125-127	4.90 – 5.00	4.90 – 5.00
127-129	5.05 – 5.15	5.05 – 5.15
130-132	**5.45 – 5.55	**5.45 – 5.55
132-134	**5.70 – 5.80	**5.70 – 5.80
135-137	**6.45 – 6.55	**6.45 – 6.55

**Same prices quoted in bags or slabs loose.

MID-WESTERN TANK CAR MARKET

Prices are those made by Chicago sellers, on Group 3 (Oklahoma) freight basis, although shipments may originate in other South-western or Mid-western refining districts

Gasoline

Prices Effective	Dec. 13	Dec. 6
U. S. Motor: (a) (Octane Test L-3)		
62 oct. and below	3.875– 4.25	3.875– 4.25
63-66 oct.	4.25 – 4.75	4.25 – 4.75
67-69 oct.	4.50 – 5.00	4.50 – 5.00
70-72 oct.	4.75 – 5.25	4.75 – 5.25
60-62, 400 e.p.	4.00 – 4.50	4.00 – 4.50
64-66, 375 e.p.	**5.00	**5.00
68-70, 350-360 e.p.	**5.25	**5.25

Kerosine

41-43 w.w.	4.00 – 4.25	4.00 – 4.25
42-44 w.w.	4.125– 4.375	4.125– 4.375

**One seller quoting.

Fuel *and* Gas Oils

Prices Effective	Dec. 13	Dec.
Domestic:		
No. 1 p.w.	4.00 – 4.125	4.00 – 4.125
No. 1 straw	3.75 – 4.00	3.875– 4.00
No. 2 straw	3.75 – 3.875	3.75 – 3.875
No. 2 dark	3.50 – 3.625	3.50 – 3.625
No. 3	3.375– 3.50	3.375– 3.50
No. 4	$1.05 –$1.10	$1.05 –$1.10
No. 5	$0.80 –$0.85	$0.80 –$0.85
Range oil	4.00 – 4.125	4.00 – 4.125
Industrial:		
No. 4	$0.95 –$1.10	$0.95 –$1.10
No. 5	$0.775–$0.85	$0.775–$0.85

Prices Effective	Dec. 13	Dec. 6
Industrial (cont'd)		
No. 6	$0.55 –$0.65	$0.55 –$0.65
U. G. I. gas oil	2.875– 3.25	2.875– 3.25

Naphtha and Solvent

Stoddard solvent	6.875	6.875
Cleaners' naphtha	7.375	7.375
V. M. & P. naphtha	7.375	7.375
Mineral spirits	6.375	6.375
Rubber solvent	7.375	7.375
Lacquer diluent	8.375	8.375

DAILY GASOLINE PRICES

Daily range of gasoline prices as reported in PLATT'S OILGRAM (Week Ended Dec. 10, 1937)

U. S. Motor, (Octane Number determined according to L-3 Method):	Dec. 6	Dec. 7	Dec. 8	Dec. 9	Dec. 10
62 octane and below:					
Oklahoma	4.125– 4.375	4.125– 4.375	4.125– 4.375	4.125– 4.375	4.125– 4.375
*North Texas	†4.50 – 4.875	†4.50 – 4.875	†4.50 – 4.875	†4.50 – 4.875	†4.50 – 4.875
West Texas	4.625– 4.75	4.625– 4.75	4.625– 4.75	4.625– 4.75	4.625– 4.75
Mid-Western (Group 3 basis)	3.875– 4.25	3.875– 4.25	3.875– 4.25	3.875– 4.25	3.875– 4.25
63-66 octane:					
Oklahoma	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75	4.50 – 4.75
*North Texas	†5.00 – 5.375	†5.00 – 5.375	†5.00 – 5.375	†5.00 – 5.375	†5.00 – 5.375
West Texas	5.125– 5.25	5.125– 5.25	5.125– 5.25	5.125– 5.25	5.125– 5.25
Mid-Western (Group 3 basis)	4.25 – 4.75	4.25 – 4.75	4.25 – 4.75	4.25 – 4.75	4.25 – 4.75
67-69 octane:					
Oklahoma	4.875– 5.125	4.875– 5.125	4.875– 5.125	4.875– 5.125	4.875– 5.125
*North Texas	†5.375– 5.75	†5.375– 5.75	†5.375– 5.75	†5.375– 5.75	†5.375– 5.75
West Texas	5.50 – 5.625	5.50 – 5.625	5.50 – 5.625	5.50 – 5.625	5.50 – 5.625
Mid-Western (Group 3 basis)	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00
70-72 octane:					
Oklahoma	5.125– 5.50	5.125– 5.50	5.125– 5.50	5.125– 5.50	5.125– 5.50
*North Texas	†5.625– 6.00	†5.625– 6.00	†5.625– 6.00	†5.625– 6.00	†5.625– 6.00
West Texas	5.875	5.875	5.875	5.875	5.875
Mid-Western (Group 3 basis)	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25	4.75 – 5.25
Motor Gasoline, 60-64 oct.					
New York harbor	†7.00	†6.75 – 7.00	†6.75 – 7.00	†6.75 – 7.00	†6.75 – 7.00
Philadelphia district	†7.00	†7.00	†7.00	†7.00	†7.00
Baltimore district	†7.00 – 7.25	†7.00 – 7.25	†7.00 – 7.25	†7.00 – 7.25	†7.00 – 7.25
Motor Gasoline, 65 oct. & above:					
New York harbor	†7.00 – 7.25	†7.00 – 7.25	†7.00 – 7.25	†7.00 – 7.25	†7.00 – 7.25
Philadelphia district	†7.00 – 7.25	†7.00 – 7.25	†7.00 – 7.25	†7.00 – 7.25	†7.00 – 7.25
Baltimore district	†7.25 – 7.50	†7.25 – 7.50	†7.25 – 7.50	†7.25 – 7.50	†7.25 – 7.50
U. S. Motor, 58-62°:					
Bradford-Warren (Western Penna.)	.....	.....	.....	.....	.....
Other districts (Western Penna.)	4.875– 5.125	4.875– 5.00	4.875– 5.00	4.875– 5.00	4.875– 5.00
Motor Gasoline, Min. 65 oct.:					
Bradford-Warren (Western Penna.)	7.25 – 7.50	7.25 – 7.50	7.25 – 7.50	7.25 – 7.50	7.25 – 7.50
Other districts (Western Penna.)	7.00 – 7.50	7.00 – 7.50	7.00 – 7.50	7.00 – 7.50	7.00 – 7.50

*For shipment to Texas and New Mexico destinations; Group 3 prices are quoted on northern shipment.
†Nominal.

TANK WAGON MARKETS

Tax column includes 1c federal tax, state gasoline tax, also city and county taxes as indicated in footnotes, and inspection fees, as shown in general footnote. These prices in effect Dec. 13, 1937, as posted by principal marketing companies at their headquarters offices, but subject to later corrections

S. O. New Jersey

ESSOLENE

	Consumer Tank Car	Dealer T.W.	Taxes	Kerosine T.W.
Atlantic City, N. J.	7.25	8.75	4	9
Newark, N. J.	7.25	8.75	4	9
Annapolis, Md.	8.35	9.85	5	9.5
Baltimore, Md.	7.75	9.25	5	9
Cumberland, Md.	9.15	11.65	5	10
Washington, D. C.	8	9.5	3	9.5
Danville, Va.	8.95	11.45	6	12.9
Norfolk, Va.	7.75	10.25	6	11.5
Petersburg, Va.	8.05	10.55	6	11.7
Richmond, Va.	8.05	10.55	6	11.7
Roanoke, Va.	9.25	11.75	6	12.9
Charleston, W. Va.	8.55	11.05	6	12.6
Parkersburg, W. Va.	7.85	10.35	6	11.2
Wheeling, W. Va.	8.85	10.25	6	12.2
Charlotte, N. C.	9.15	11.65	7	12.6
Hickory, N. C.	9.65	12.15	7	13
Mt. Airy, N. C.	9.45	11.95	7	12.8
Raleigh, N. C.	8.75	11.25	7	12.1
Salisbury, N. C.	9.25	11.75	7	12.7
Charleston, S. C.	7.75	10.25	7	11.1
Columbia, S. C.	8.75	11.25	7	12.1
Spartanburg, S. C.	9.45	11.95	7	12.9

Price basis to undivided dealers: Dealer t.w. price less 0.5c per gal.

Price basis to commercial consumers: To contract accounts, purchasing at least one full compartment at a time by hose connection: Effective March 12, 1937, in New Jersey, and March 8 in Maryland, District of Columbia, and in Arlington and Fairfax Counties in Virginia, on yearly purchases: from 2,500 to 100,000 gals., consumer t.w. price at time and place of delivery; 100,000 gals. per year consumer tank car price, plus 0.5c per gal. Generally consumer t.w. price in foregoing states is equivalent of dealer t.w. price, less 0.5c per gal.

Effective May 15, 1937, on Essolene and Esso (by tank wagon) in North and South Carolina, West Virginia and Virginia (except Arlington and Fairfax Counties, which see above), commercial consumers taking deliveries of 50 gals. (West Va. 100 gals.) or more at one time will be billed at the posted consumer t.w. price. Deliveries less than 50 gals. (West Va. 100 gals.) will be billed at 4c per gal. over posted consumer t.w. price. Generally, posted consumer t.w. price will be equivalent to the dealer price less 0.5c per gal.

Kerosine Discount: 1c off t.w. price for 25 gals or more, under contract thru territory (Baltimore City contract not necessary) except no discount in state of New Jersey.

Socony-Vacuum Oil Co., Inc.

(S. O. New York Division)

SOCONY MOBILGAS

	Consumer Tank Car	"Split" Dealer T.W.	Taxes	Total "Split" Dealer T.W.	Kerosine T.W.
Metropolitan N. Y. City: Boroughs of Manhattan, Bronx and Brooklyn (Kings and Queens)	8	9.5	*5	14.5	9
Borough of Richmond (Staten Is.)	8	9.5	*5	14.5	9
Albany, N. Y.	8	9.5	5	14.5	9
Binghamton, N. Y.	8.75	10.3	5	15.3	9
Buffalo, N. Y.	8.54	10.05	5	15.05	7.5
Jamestown, N. Y.	8.28	10.8	5	15.8	8.25
Plattsburg, N. Y.	8.4	10.4	5	15.4	9.5
Rochester, N. Y.	8.67	10	5	15	8.5
Syracuse, N. Y.	8.62	9.5	5	14.5	9.5
Danbury, Conn.	8.3	9.8	4	13.8	9
Hartford, Conn.	8.1	9.6	4	13.6	8.5
New Haven, Conn.	8	9.5	4	13.5	8
Bangor, Me.	8.6	8.8	5	13.8	9.5
Portland, Me.	8	9.8	5	14.8	8.75
Boston, Mass.	8	9	4	13	8.5
Concord, N. H.	8.7	11.3	5	16.3	9.5
Lancaster, N. H.	9.6	12.3	5	17.3	10.25
Manchester, N. H.	8.5	10.8	5	15.8	9.5
Providence, R. I.	8	9.5	4	13.5	8.5
Burlington, Vt.	8.4	10.4	5	15.4	9.5
Rutland, Vt.	8.7	10.7	5	15.7	9

*Plus 2% city sales tax computed at time of each sale

Note: Socony-Vacuum has transferred all service stations to dealers; no prices available

Price basis to undivided dealers: 0.5c less than "split" dealer t.w

Price basis to commercial consumers: Effective about Nov. 15, 1936 in New York and New England, for tank wagon delivery: monthly purchases of 25,000 gals. or over, pay consumer tank car price at point of delivery, plus 0.5c gal.; monthly purchases of 5,000 to 25,000 gals., pay undivided dealer tank wagon price at point of delivery; monthly purchases of less than 5,000 gals., pay divided dealer tank wagon price at point of delivery. Private consumers pay undivided dealer tank wagon price at point of delivery, plus 2c gal.

Atlantic Refining

ATLANTIC WHITE FLASH GASOLINE

	Commercial Tank Car	All Tax	Total Dealer T.W.	S.S.	Kerosine T.W.
Philadelphia, Pa.	7.25	5	13.25	17	10.5
Pittsburgh	8	5	15	20	11
Allentown	7.75	5	14.25	**	11
Erie	8	5	14.5	**	10
Scranton	8	5	14.5	**	11
Altoona	8	5	15	**	11
Harrisburg	7.5	5	14	**	11
Williamsport	8	5	15	**	11
Dover, Del.	...	5	14.5	**	11
Wilmington	...	5	14	**	11
Boston, Mass.	...	4	13	**	8.5
Springfield, Mass.	...	4	13.3	**	8.5
Worcester, Mass.	...	4	14.3	**	9
Fall River, Mass.	...	4	12.5	**	8.5
Hartford, Conn.	...	4	13.6	**	9
New Haven, Conn.	...	4	13.5	**	9
Providence, R. I.	...	4	13.5	**	8.5
Atlantic City, N. J.	...	4	12.75	**	9
Camden, N. J.	...	4	12.75	**	9
Trenton, N. J.	...	4	12.75	**	9
Annapolis, Md.	...	5	14.85	**	9.5
Baltimore, Md.	...	5	14.25	**	9
Hagerstown, Md.	...	5	15.25	**	10
Richmond, Va.	...	6	16.55	**	11.7
Wilmington, N. C.	...	7	17.35	**	11.3
Brunswick, Ga.	...	7	16	**	*13
Jacksonville, Fla.	...	8	17	**	10

*Georgia has kerosine tax of 1c per gal., not included in above price.

**Atlantic Refining transferred stations to dealers; no prices available.

Price basis to undivided dealers: Dealer t.w. less 0.5c per gal.

Price basis to commercial consumers: in Penna. and Delaware, effective Mar. 11, 1937, on yearly gasoline purchases to contract accounts taking full compartment hose deliveries, using 100,000 gals. or more per year, tank car price plus 0.5c per gal.; consumers taking less than 100,000 gals., undivided dealer price. Consumers under contract and not under contract, taking less than full compartment delivery, and consumers not under contract taking full compartment delivery, get divided dealer price. Consumers taking less than 25 gals., t.w delivery, get 4c above undivided dealer price.

Discount on kerosine: Effective Oct. 29, 1936, in Pennsylvania and Delaware. 2c per gal. off t.w. price on t.w. deliveries of 25 gals. or more at one time.

S. O. Ohio

SOHIO X-70 GASOLINE

	All Tax	Consumer T.W.	**Commercial T.W.	†Divided Dlr.	Kerosine T.W.
Ohio State-Wide	5	16.5	....	15.5	*13
Allen, Auglaize, Champaign, Darke, Geauga, Logan, Lorain, Mercer, Putnam, Shelby and Van Wert counties:	5	16.5	15	15.5	....
Defiance county	5	15.5	....	14.5	....
Counties where prices are below statewide:					
Columbiana and Pickaway	5	16	....	15	....
Franklin and Knox	5	15.5	....	14.5	....
Paulding	5	15	13.5	14	....

RENOWN GASOLINE (Third Grade)

Ohio State-Wide	5	16	....	15	....
Allen, Auglaize, Champaign, Geauga, Logan, Lorain, Mercer, Putnam, Shelby and Van Wert counties:	5	16	14.5	15	....
Defiance county	5	15	....	....	....
Erie, Fulton, Lucas, Ottawa, Sandusky, Williams and Wood	5	16	....	15	....
Hamilton county	5	16.5	....	15.5	....
Counties where prices are below statewide:					
Columbiana and Pickaway	5	15.5	....	14.5	....
Franklin and Knox	5	15	....	14	....
Paulding	5	14.5	13	13.5	....
Counties where prices are above statewide:					
Butler, Clermont, Greene, Miami, Montgomery, Preble and Warren	5	16.5	....	15.5	....
Darke county	5	16.5	15	15.5	....

S. O. Ohio Cont'd

KEROSINE PRICES

(Off Statewide Level)

Kerosine prices are off statewide level in the following counties:

Allen, Auglaize, Champaign, Columbiana, Darke, Geauga, Greene, Hardin, Logan, Mahoning, Mercer, Preble, Putnam, Shelby, Trumbull, Union, Van Wert and Wyandot: *12.5

Paulding *12

Ashtabula *11.5

Fayette, Licking, Madison, Pickaway, Portage and Summit *9.5

*Kerosine prices include 1c state tax.

**Commercial consumer t.w. posted price discontinued statewide, Oct. 20, 1937, except in 11 counties, these being: Allen, Auglaize, Champaign, Darke, Logan, Lorain, Mercer, Paulding, Putnam, Shelby and Van Wert.

Commercial Tank Wagon Q.D.A. to contract accounts: Effective Oct. 20, 1937, thru Ohio (except in 23 counties), on monthly purchases, off posted consumer t.w. price: 0 to 999 gals., 1c; 1,000 to 19,999 gals., 1.5c; 20,000 gals. and over, 2.5c. The 23 counties where Q.D.A. differs from statewide are: Allen, Auglaize, Champaign, Darke, Defiance, Erie, Fulton, Hamilton, Henry, Logan, Lorain, Lucas, Meigs, Mercer, Ottawa, Paulding, Putnam, Sandusky, Scioto, Shelby, Van Wert, Williams and Wood.

†This price also to authorized agents, exclusive of 0.5c rental.

Sales tax: Ohio's 3% sales tax, effective Jan. 27, 1935, is added "where assessable, to regular posted prices", S. O. Ohio says.

On kerosine, prices to resellers and commercial consumers are posted generally at 3c per gal. below consumer t.w. price in any quantity, when such prices are on state-wide level.

S. O. Kentucky

CROWN GASOLINE

(Regular Grade)

	Consumer T.W.	All Tax	Total Consumer T.W.	Net Dlr.	Kerosine T.W
Covington, Ky.	13	6	19	16	11
Lexington, Ky.	13.5	6	19.5	16.5	11
Louisville, Ky.	13	6	19	16	10.5
Paducah, Ky.	13.5	6	19.5	16.5	10
Jackson, Miss.	13	7	20	17	*13
Vicksburg, Miss.	13	7	20	17	*13
Birmingham, Ala.	14	*8	22	19	12
Mobile, Ala.	13	*9	22	19	11
Montgomery, Ala.	13	*9	22	19	*14.5
Atlanta, Ga.	14	7	21	18	*12
Augusta, Ga.	14	7	21	18	*14
Macon, Ga.	14	7	21	18	*14.5
Savannah, Ga.	12	7	19	16	*12
Jacksonville, Fla.	12	8	20	17	10
Miami, Fla.	12.5	8	20.5	17.5	12.5
Pensacola, Fla.	13	*9	22	19	12
Tampa, Fla.	11	8	19	16	10.5

KYSO GASOLINE

(Third Grade)

Covington, Ky.	11	6	17	14.5	....
Lexington, Ky.	11.5	6	17.5	15	....
Louisville, Ky.	11	6	17	14.5	....
Jackson, Miss.	11.5	7	18.5	16	....
Vicksburg, Miss.	11.5	7	18.5	16	....
Birmingham, Ala.	12	*8	20	17.5	....
Mobile, Ala.	10.5	*9	19.5	17	....
Montgomery, Ala.	10.5	*9	19.5	17	....
Atlanta, Ga.	12	7	19	16.5	....
Augusta, Ga.	12	7	19	16.5	....
Macon, Ga.	12.5	7	19.5	17	....
Savannah, Ga.	10.5	7	17.5	15	....
Pensacola, Fla.	11	*9	20	17.5	....

Discounts to all tank wagon consumers: Effective Jan. 4, 1937, thru territory, on Crown gasoline, 3c per gal. below consumer t.w. price; on Kyso, 2.5c below, regardless of quantity purchased, per month.

Discounts on kerosine: Prices in Kentucky are net, but in other states subject to 2c discount.

**Taxes*: in the tax column is included these city and county gasoline taxes at the following points: Mobile, 2c city; Birmingham, 1c city; Montgomery, 1c city and 1c county; Pensacola, 1c city. Georgia and Mississippi kerosine prices include 1c state tax. Montgomery kerosine price includes 1c city tax.

Above prices include these inspection fees on both gasoline and kerosine, per gallon, figured on basis of 50 gallons per barrel:

Alabama, 1/40c on gasoline, 1/2c on kerosine; Arkansas, 1/5c per gal. in a single barrel. 1/20c per gal. in bulk; Florida, 1/8c; Illinois, 3/100c; Indiana, 1/5c per gal. in lots up to 25 bbls.; 2/25c per gal. in lots of 25 bbls. or more; Kansas, 1/50c, (3/50c can be charged to meet inspection department expenses); Louisiana, 1/32c; Minnesota, 1/25c; Missouri, 3/100c; Nebraska, 3/100c; Nevada, gasoline,1/20c; North Carolina, 1/4c; North Dakota, 1/20c; Oklahoma, 2/25c per gal. in lots of more than 50 bbls., 1/5c in lots less than 50 bbls.; South Carolina, 1/8c; South Dakota, 1/10c; Tennessee, 2/5c; and Wisconsin, 2/25c.

Kerosine inspection fee only: Iowa, 3/50c; Michigan, 1/5c per gal.

TANK WAGON MARKETS

Tax column includes 1c federal tax, state gasoline tax, also city and county taxes as indicated in footnotes, and inspection fees, as shown in general footnote. These prices in effect Dec. 13, 1937, as posted by principal marketing companies at their headquarters offices, but subject to later corrections

S. O. Indiana

	Tax	Red Crown Total T.W.	Dealer Prices Red Crown Cons.	Stano-lind	Kero-sine T.W.
Chicago, Ill.	4	15.3	13.3	12.1	10.2
Decatur, Ill.	4	15.3	13.8	13.1	10.2
Joliet, Ill.	4	15.3	13.8	13.3	10.2
Peoria, Ill.	4	15.3	13.8	13.3	10.2
Quincy, Ill.	4	15.1	13.6	12.5	10
Indianapolis, Ind.	5	16.9	15.4	14.7	*14.8
Evansville, Ind.	5	16.8	15.3	13.1	*14.7
South Bend, Ind.	5	17.2	15.7	14.2	*14.2
Detroit, Mich.	4	15.1	13.6	13.1	9.8
Grand Rapids, Mich.	4	16.3	14.8	14.3	11
Saginaw, Mich.	4	16.1	14.6	14.1	*9.1
Green Bay, Wis.	5	17	15.5	14.8	10.9
Milwaukee, Wis.	5	16.5	15	14.2	10.4
La Crosse, Wis.	5	16.7	15.2	14.7	10.6
Minneapolis-St. Paul.	5	16.7	15.2	14.7	10.6
Duluth, Minn.	5	17	15.5	15	10.9
Mankato, Minn.	5	16.7	15.2	14.7	9.5
Des Moines, Ia.	4	15.1	13.6	12.1	*13
Sioux City, Ia.	4	15.3	13.8	13.3	*13.2
Davenport, Ia.	4	15.3	13.8	13.3	*13.2
Mason City, Ia.	4	15.4	13.9	13.4	*13.3
St. Louis, Mo.	*4	14.9	13.4	11.2	9.8
Kansas City, Mo.	*4	14.6	13.1	12.6	8.5
St. Joseph, Mo.	*4	14.6	12.4	12	9
Fargo, N. D.	4	16.7	15.2	14.7	11.6
Minot, N. D.	4	17.9	16.4	15.9	12.8
Huron, S. D.	*5	17.1	15.6	15.1	*11
Wichita, Kans.	4	14.1	12.4	10.5	8.5

*Taxes: in the tax column is included these city and state gasoline taxes at following points: Kansas City, St. Joseph and St. Louis, 1c city tax; South Dakota, 0.1c sales tax. State Kerosine taxes: Indiana, 4c; Iowa, 3c, all included in above prices.

Discount to commercial consumers: Effective Jan. 1, 1935, thru territory, except Michigan effective Feb. 1, on purchases per month, discount off t.w prices; all gasolines, 25 to 1,000 gals., at t.w. price; 1,000 gals., or more, 1.5c off t.w. on Ethyl and Red Crown, and 1c on Stanolind (latter effective June 9, 1937). Minimum delivery is 25 gals.

S. O. Nebraska

STANDARD RED CROWN GASOLINE

	All Tax	T.W. Total	Dealer Total	Kero-sine T.W.
Omaha, Neb.	6	17.7	16.2	10.5
McCook	6	18.1	14.1	11.1
Norfolk	6	18.1	16.6	10.9
North Platte	6	18.5	17	11.3
Scottabluff	6	19.2	16	12

Discounts to commercial consumers: for tank wagon deliveries covered only by Standard Commercial Consumer Contract, effective January 1, 1935.

S. O. Louisiana

ESSOLENE

	Consumer Tank Car	Dealer T.W.	Taxes	Kero-sine T.W.
Little Rock, Ark.	7.75	10.25	7.5	11.5
Alexandria, La.	7.75	10.25	8	*10.5
Baton Rouge, La.	7.25	9.75	8	*12
New Orleans, La.	7.25	9.75	*10	*11
Lake Charles, La.	8.25	10.75	8	*12.5
Shreveport, La.	6.75	9.25	8	*9.5
Lafayette, La.	8.25	10.75	8	*13
Bristol, Tenn.	10.25	11.5	8	14.5
Chattanooga, Tenn.	9.75	12.25	8	13.5
Knoxville, Tenn.	10.25	12.75	8	14
Memphis, Tenn.	8.25	10.75	8	12
Nashville, Tenn.	9.25	11.75	8	11.5

*New Orleans gasoline tax includes 7c state, 1c federal, and 2c parish tax. Louisiana kerosine prices include 1c state tax; in addition New Orleans has 1c parish tax.

Price basis to dealers: Undivided dealers get dealer price, less 0.5c.

Price basis to commercial consumers: Effective May 15, 1937, thru territory; commercial consumers taking 50 gals. or more at one time will be billed at posted consumer t.w. price; those taking less than 50 gals. at one time will be billed at 4c per gal. over posted consumer t.w. price. Generally, the posted consumer t.w. price will be equivalent to the dealer price less 0.5c per gal.

Humble Oil & Refining Co.

HUMBLE MOTOR FUEL

	*T.W.	Taxes	*Total T.W.	S.S.	Kero-sine T.W.
Dallas, Tex.	8.5	5	13.5	17	8
Ft. Worth, Tex.	9	5	14	18	8
Houston, Tex.	9.5	5	14.5	18.5	8
San Antonio, Tex.	8.5	5	13.5	17	8

U. S. Motor Gasoline
(Third Grade)

Dallas, Tex.	7	5	12	14	
Ft. Worth, Tex.	7.5	5	12.5	15	
Houston, Tex.	8.5	5	13.5	16.5	
San Antonio, Tex.	7	5	12	14	

*Price is t.w. price to all classes of dealers and consumers.

Price basis to "open" dealers: discount off posted retail price: when posted retail price, including all taxes on Esso motor fuel is: 19.1c per gal. and above, discount is 3.5c; 19c to 18.1c, 3c, and 18c and below, 2.5c. Humble motor fuel, 17.1c and above, 3.5c; 17 to 16.1c, 3c; and 16c and below, 2.5c; U. S. motor fuel, 15.1c and above, 2.5c; 15 to 14.1c 2c; and 14c and below, 1.5c.

Continental Oil

	Conoco Bronze Ex-Tax	All Tax	Dealer Prices Total Conoco Bronze	De-mand	Kero-sine T.W.
Denver, Colo.	10	5	15	14	11.5
Grand Junc., Colo.	14	5	19	18	15
Pueblo, Colo.	11	5	16	14	10.5
Casper, Wyo.	12	5	17	16	11.5
Cheyenne, Wyo.	11	5	16	11	13
Billings, Mont.	13.5	6	19.5	18	15.5
Butte, Mont.	13.5	6	19.5	16.5	15.5
Great Falls, Mont.	13.5	6	19.5	18.5	15.5
Helena, Mont.	13.5	6	19.5	18.5	15.5
Salt Lake City, Utah.	14.5	5	19.5	16.5	16
Boise, Ida.	15.5	6	21.5	20.5	18
Twin Falls, Ida.	15	6	21	20	18
Albuquerque, N. M.	11	†6.5	17.5	16.5	12
Roswell, N. M.	11	†6.5	17.5	15	10.5
Santa Fe, N. M.	12	*7	19	16.5	12
Muskogee, Okla.	9.5	5	14.5	13	7
Oklahoma City, Okla.	9	5	14	11	8
Tulsa, Okla.	9	5	14	11	6
Ft. Smith, Ark.	9.75	5	14.75	13.5	8
Little Rock, Ark.	9.75	7.5	17.25	15.125	9.5
Texarkana, Ark.	9.5	5	14.5	12.5	8.5

†Includes city tax of 0.5c.
*Includes 1c city tax.

S. O. California

STANDARD GASOLINE

	T.W.	Taxes	Total T.W.	S.S.	Kero-sine T.W.
San Francisco, Cal.	13.5	4	17.5	18.5	11.5
Los Angeles, Cal.	13	4	17	18	9
Fresno, Cal.	14.5	4	18.5	19.5	12
Phoenix, Ariz.	15	6	21	22	†16
Reno, Nev.	15	5	20	21	13
Portland, Ore.	14	6	20	21	13.5
Seattle, Wash.	14	6	20	21	13.5
Spokane, Wash.	17	6	23	24	16.5
Tacoma, Wash.	14	6	20	21	13.5

FLIGHT GASOLINE
(Third Grade)

San Francisco, Cal.	12	4	16	17	....
Los Angeles, Cal.	11.5	4	15.5	16.5	....
Fresno, Cal.	13	4	17	18	....
Reno, Nev.	13.5	5	18.5	19.5	....
Phoenix, Ariz.	13.5	6	19.5	20.5	....
Portland, Ore.	12.5	6	18.5	19.5	....
Seattle, Wash.	12.5	6	18.5	19.5	....
Spokane, Wash.	15.5	6	21.5	22.5	....
Tacoma, Wash.	12.5	6	18.5	19.5	....

†Includes 5c state tax.

Discount to dealers: on gasoline, off t.w. price on Standard Ethyl and Standard Gasoline, to 100% dealers, 3c; to split dealers, 2c; on Flight gasoline, both 100% and split dealers, 2c.

On Stanavo Aviation Gasoline, to all classes of dealers, 3c off t.w.

To commercial consumers: off tank wagon price: on single deliveries of 40 gallons and over, Stanavo Aviation, Standard Ethyl and Standard Gasolines, 3c. Flight Gasoline, 2c per gallon. Tank wagon delivery, less than 40 gals., 1c per gal. above posted t.w. price.

On kerosine in tank car, transport truck and trailer delivery, 3c off t.w. price; plant deliveries to jobbers, 2.5c below t.w.

Canada

PRICES OF IMPERIAL OIL LTD.

Per Imperial Gallon, which is 1.2 U. S. Gallons

3-STAR IMPERIAL GASOLINE

	T.W.	Taxes	Total T.W.	Kero-sine T.W.
Hamilton, Ont.	16	6	22	17
Toronto, Ont.	16	6	22	17
Brandon, Man.	22.8	7	29.8	22.3
Winnipeg, Man.	20.5	7	27.5	20.7
Regina, Sask.	21.5	7	28.5	22
Saskatoon, Sask.	24.3	7	31.3	24.8
Edmonton, Alta.	21	7	28	23
Calgary, Alta.	18.5	7	25.5	20.5
Vancouver, B. C.	16	7	23	23
Montreal, Que.	15	6	21	17.5
St. John, N. B.	16	8	24	18.5
Halifax, N. S.	16	8	24	18.5

Note: Imperial Oil Ltd. has completed transfer of service stations to dealers; no s.s. prices available.

Discounts to undivided dealers, 1c off t.w price, except Maritime Provinces where undivided dealers pay t.w. price. Divided dealers pay t.w. price, thru territory.

Aviation Gasoline

Following are tank car and/or tank wagon prices of aviation gasoline in principal marketing territories (Stanavo aviation in all territories except where otherwise noted). Tax column includes 1c federal tax, and state tax; also municipal taxes as indicated in footnotes. Prices in first four territories do not include state or federal taxes.

S. O. NEW JERSEY

	*Ethyl T.C.	Tank Car	T.W.
Bayonne, N. J.	19.5	9.5	12.5
Baltimore, Md.	....	10	12.5
Washington, D. C.	....	....	13 1
Richmond, Va.	....	....	14.7
Greensboro, N. C.	....	....	15.7
Raleigh, N. C.	....	....	17 6
Charleston, W. Va.	....	....	12.2

*This is Stanavo Ethyl Aviation Gasolin 100 octane number, tank car price.

COLONIAL BEACON OIL CO.

	T.W.
Brooklyn, N. Y.	12.8
Buffalo, N. Y.	14.5
Boston, Mass.	15

S. O. PENNSYLVANIA

Philadelphia, Pa.	13.6
Pittsburgh, Pa.	14.4

S. O. LOUISIANA

New Orleans, La.	13.3
Shreveport, La.	13.6

Prices in above four territories are on a 74 octane grade aviation gasoline except where otherwise noted. An 80 octane product generally brings 0.5c premium and an 87 octane product, 1.5c premium over the 74 octane grade.

Note: S.s. prices in above four territories are generally 6c over t.w. prices. Above t.w prices are net, with no discounts allowed for quantity purchases. T.w. prices are generally tank car price, plus freight, plus 2.5c per gal.

S. O. OHIO

Thru Ohio

Stanavo Ethyl Aviation

	Consumer T.W.	Tax	Total Consumer T.W.
73 octane	15.5	5	20.5
80 octane	16.5	5	21.5
87 octane	17.5	5	22.5

Discounts: For delivery on contract to hangar operators and resellers: 2c below consumer posted t.w. price, shown above.

S. O. INDIANA

Stanolind Aviation Gasoline

(73 octane number at Kansas City; 62 octane at other published points)

Chicago, Ill.	14.6	4	18.6
Detroit, Mich.	16.1	4	20.1
Milwaukee, Wisc.	14.8	5	19.8
Minneapolis, Minn.	15	5	20
St. Louis, Mo.	14.2	3	17.2
Kansas City, Mo.	13.9	*4	17.9
Fargo, N. D.	16	4	20
Huron, S. D.	15.4	5	20.4

*Includes 1c city tax.

HUMBLE OIL & REFINING CO.

	Tank Car
Baytown, Tex. (exclusive of taxes)	8.5

CONTINENTAL OIL CO.

Conoco Special Gasoline	Dealer	Tax	Total Dealer
Denver, Colo.	13	5	18
Cheyenne, Wyo.	15	5	20
Helena, Mont.	16.5	6	22.5
Salt Lake City, Utah.	17.5	5	22.5
Albuquerque, N. M.	14	*6.5	20.5

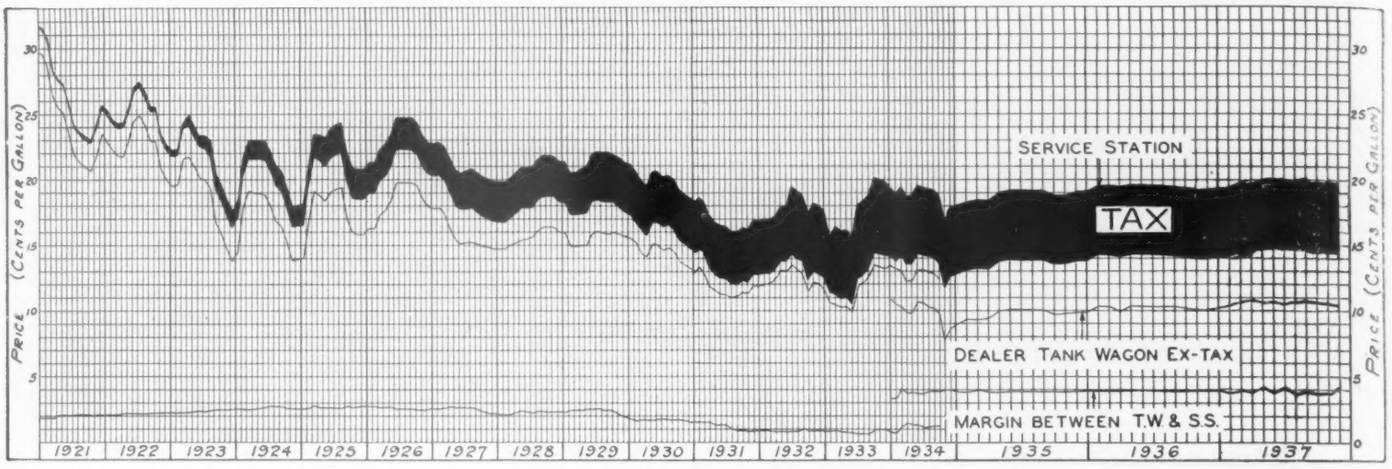
*Includes city tax of 0.5c

S. O. CALIFORNIA

	T.W.		Total T.W.
Phoenix, Ariz.	17	6	23
Los Angeles, Cal.	15	4	19
San Francisco, Cal.	15.5	4	19.5
Reno, Nev.	17	5	22
Portland, Ore.	16	6	22
Seattle, Wash.	16	6	22
Spokane, Wash.	19	6	25

Note: For discounts, etc., see note under Standard and Flight gasoline above.

Trend of Gasoline Prices and Gasoline Taxes, at 50 Representative Cities



California

(*Continued from page* 64)

down into values placed on bulk quantities of fuel and diesel oil. One observer believed current quotations on diesel oil in cargo lots should be on a parity with bunker prices of $1.65 a barrel on the product, f.o.b. San Pedro.

Others thought the top on diesel fuel oil in bulk was $1.50 and that some would be available at slightly under this figure. The low on Grade C fuel oil in bulk appeared to be 85 cents, although no spot sales were reported.

In domestic markets, some independent gasoline was available at 7.75 cents a gallon at the refinery loading rack, exclusive of all tax, although most plants were asking upward of 8.25 cents for competitive third-grade brands.

There was good demand for burning oils and firm prices ruled. A good grade of diesel oil was offered at independent plants in the Los Angeles Basin at 3.5 to 4 cents, with more and more sales being made at near the higher figure. Stove-distillate brought upward of 4 cents.

Wax

Market in Doldrums

NEW YORK, Dec. 13.—Crude scale wax continued in the doldrums the past week, traders generally said. Open spot market buying was light, but no particular change was noted in prices. Traders said it continued to be a case of buyers offering to pay less than sellers were willing to take with neither side giving in to any appreciable extent. Some trading was reported at a minimum of 2.85 cents for 124-126 white crude scale.

TANK WAGON MARKETS

Tax column includes 1c federal tax, state gasoline tax, also city and county taxes as indicated in footnotes, and inspection fees, as shown in general footnote. These prices in effect Dec. 13, 1937, as posted by principal marketing companies at their headquarters offices, but subject to later corrections

Naphtha (In Tank Wagon)

S. O. NEW JERSEY

Posted Tank Wagon Prices	Mineral Spirits	V.M.&P.
Newark, N. J.	11.5	15.5
Baltimore, Md.	15.5	....
Washington, D. C.	15	....

Discounts: Buyers taking following quantities, at one time, get these discounts: Newark, 2c per gal. on 200 gals. or more; less than 200 gals., 0.5c higher price. Baltimore 2c off on 25 to 100 gals. and 3c on over 100 gals. Washington, 2c off to contract buyers.

SOCONY-VACUUM OIL CO.

Buffalo, N. Y.	13	14
New York City	10.5	11.5
Rochester, N. Y.	13	15
Syracuse, N. Y.	14	15
Boston, Mass.	13.5	14
Bridgeport, Conn.	12.5	14
Hartford, Conn.	12	13.5
Providence, R. I.	13.5	14.5

ATLANTIC REFINING CO.

Philadelphia, Pa.	11.5	12.5
Lancaster, Pa.	13	14
Pittsburgh, Pa.	12.5	14.5

Note: Prices for Mineral Spirits also apply to Stoddard Solvent; and prices for V.M.&P. Naphtha apply also to Light Cleaners Naphtha.

S. O. OHIO

	S.R. Solvent	V.M.&P. Naphtha
Thru Ohio	13.25	13.75

Note: V.M.&P. Naphtha prices also apply on Dry Cleaners naphtha and special Varnolene; Varnolene and Sohio Solvent 0.5c below these prices. Discounts to contract consumers, off t.w. price: 300 to 999 gals., 0.5c; 1,000 to 2,499 gals., 0.75c; 2,500 to 4,999 gals., 1c; 5,000 or more gals., 1.5c.

S. O. INDIANA

(Prices include state and federal taxes)

	Oleum Spirits	V.M.&P. Naphtha	Stanisol
Chicago, Ill.	15.9	16.2	15.6
Detroit, Mich.	19.3	18.3	19.4
Kansas City, Mo.	14.4	15.4	14.4
St. Louis, Mo.	14.7	15.7	14.6
Milwaukee, Wis.	19.3	20.3	19.3
Minneapolis, Minn.	19.5	20.5	18.1

Note: Prices for V. M. & P. apply also to Light Cleaners Naphtha. All prices, with exception of Missouri points, include state tax. Prices shown are base prices, before discounts.

Naphtha (In Tank Cars)

In Tank Cars (F. o. b. refinery or seaboard terminal except Ohio, delivered price.)

	V.M.&P. Naphtha	Solvent
Baltimore	11	10
New York Harbor	10.5-11	9.00-9.5
Philadelphia district	11	10
Boston	10.5	10
Providence	10.5	10
Ohio points, delivered	9.375	*8.50

*This is on rubber solvent.

Note: In Ohio, prices on D.C. naphtha and special Varnolene are same as V.M.&P.; on Varnolene and Sohio Solvent, prices are 0.5c less than on V.M.&P.

Latest Changes

From Dec. 7 to Dec. 13 inclusive. Dates and amounts of changes shown. See table for full current prices.

S. O. New Jersey—Essolene:
Wheeling, dealer t. w. was cut 0.75c, Dec. 8, to 10.25c.
Atlantic Refining—Atlantic White Flash:
Philadelphia, dealer t. w. cut 0.5c, Dec. 9.
S. O. Nebraska—Kerosine:
McCook, t. w. up 1c, Dec. 7.
S. O. Louisiana—Kerosine:
Alexandria, t. w. cut 1.5c, Dec. 8.
Continental Oil—All gasolines:
Cut 1.5c, Denver, Dec. 13.

Corrections

Notation of amount of change and dates not previously shown in table. Table in this issue is corrected to show these changes.

S. O. New Jersey—Essolene:
Consumer t. c. cut 0.65c, Wheeling instead of 0.75c, in general 0.75c cut, Nov. 15, to 8.85c, and dealer t. w. unchanged at 11c.
Socony-Vacuum Oil Co.—Kerosine:
Buffalo, t. w. cut 1c, Nov. 26.
New Haven, t. w. cut 1c, Dec. 3.
Hartford, t. w. cut 0.5c, Nov. 16.
S. O. Kentucky—Crown:
Macon, cut 0.5c, Nov. 29.
Tampa, up 1c, Nov. 8; cut 1c, Nov. 18.
Kuso:
Savannah, up 1c, Nov. 12.
S. O. Indiana—Kerosine:
In Dec. 6, general advance of 0.5c, Mankato was cut 1.1c, instead of unchanged as reported on page 60, Dec. 8th issue.

SEABOARD MARKETS, EXPORT AND COASTWISE

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). In cargo markets, spot shipment is 90 days. Prices in cents per gallon, except heavy fuel oil in dollars per barrel, in tank car lots, f.o.b. refineries or seaboard terminals in districts designated, unless otherwise noted. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude. Unless otherwise noted, gasoline octane ratings are determined by C.F.R. Motor method, A.S.T.M.D-357-33T; and lubricating oil specifications determined according to A.S.T.M. methods, unless otherwise noted.

Eastern Domestic

(Inter-refinery and export prices not included.)

MOTOR GASOLINE

Prices Effective	Dec. 13	
District:	***60-64 Oct.**	***65 Oct. & Above**
N. Y. harbor	6.75 – 7.00	7.00 – 7.25
†N.Y. harbor	6.625– 6.75	6.875– 7.00
Philadelphia	7.00	7.00 – 7.25
Baltimore	7.00 – 7.25	7.25 – 7.50
Norfolk	7.00 – 7.25	7.50•
Wilmington, N. C.	7.25	7.50
Charleston, S. C.	7.25	7.50
Savannah	7.00 – 7.25	7.25 – 7.50
Jacksonville	7.00 – 7.25	7.25 – 7.50
Portland	7.50	7.75
Boston	6.75 – 7.00	7.00 – 7.50
Providence	7.00 – 7.25	7.25 – 7.50

*Prices are nominal. †Barge lots.

WATER WHITE KEROSINE

District:			
N. Y. harbor	6.25	Charleston	6.00–6.25
*N. Y. harbor	6.125	Savannah	5.75
Philadelphia	6.25	Jacksonville	5.75
Baltimore	6.25	Portland	6.75
Norfolk	6.00–6.25	Boston	‡6.25 — 6.40
Wilmington, N.C.	6.00–6.25	Providence	6.40

*Barge lots.

†FUEL OILS

	N. Y. harb.	N. Y. harb. barges
No. 1	6.25	6.125
Nos. 2-3	5.25	5.125
No. 4	5.25	5.00 – 5.125
No. 5	$1.45 –$1.55	.....
No. 6	$1.25	.....

	Phila. dist.	Balt. dist.
No. 1	6.25	6.25
Nos. 2-3	5.25	**5.25
No. 4	4.75 – 5.25	**5.25
No. 5	$1.45–$1.475	$1.45–$1.55
No. 6	$1.25	$1.25

	Bost. dist.	Prov. dist.
No. 1	‡6.25 – 6.40	6.40
Nos. 2-3	††5.40	††5.40
No. 4	††5.40	††5.40
No. 5	$1.45–$1.55	.....
No. 6	$1.25	.....

†Fuel oils meet specifications of U. S. Commercial Standards CS12-35.

**Some suppliers quote 5c f.o.b. terminal for shipment within Baltimore switching district.

††Some suppliers quote 5.40c delivered Boston and Providence districts.

‡Some suppliers quote 6.25c f.o.b. terminal; others 6.40c delivered Boston district.

District:	†Bunker C Fuel	†Diesel Oil
N. Y. harbor	***$1.25	**$2.20
Philadelphia	***$1.25	***$2.10–2.20
Baltimore	***$1.25	**$2.20
Norfolk	*$1.25	$2.20
Charleston	$1.20	$2.20
Savannah	*$1.20	$2.20
Jacksonville	*$1.20	$2.20
Tampa	*$1.20	$2.20
Portland	$1.35	$2.35
Boston	***$1.25	**$2.20
Providence	$1.25	$2.25

†In ship's bunkers.
*For barging add 5c per bbl.
**For barging add 6.5c to 7.5c per bbl.
***For barging add 5c to 6c per bbl.

	Gas Oil 28-34 Gravity	Diesel Oil Shore Plants
N. Y. harbor	5.25	5.25
Philadelphia dist.	5.00	....
Baltimore dist.	5.25	....
Norfolk dist.	5.25	....
Savannah dist.	....	5.25
Jacksonville dist.	....	5.25

Pacific Export

(Quotations are at seaboard, Los Angeles, in cargo lots, cents per gal., except where otherwise noted.)

Prices Effective	Dec. 13	Dec. 6
U. S. Motor, under 65 oct.	5.75 – 6.00	5.75 – 6.00
400 e.p. blend, under 65 oct.	6.00 – 6.125	6.00 – 6.125
400 e.p. blend 65 oct. & above	6.125– 6.375	6.125– 6.375
*38-40 w.w. kerosine	4.75 – 5.00	4.75 – 5.00
41-43 w.w. kerosine	5.00 – 5.50	5.00 – 5.50
44 w.w. kerosine	5.50 – 5.75	5.50 – 5.75

*150 fire point.

Prices Effective	Dec. 13	Dec. 6
In Cargo lots, per bbl.		
Diesel fuel, 24° & above	$1.45 –$1.50	$1.45 –$1.50
Diesel fuel, under 24°	$1.40 –$1.45	$1.40 –$1.45
*30-34 diesel (gas oil)	$1.55 –$1.65	$1.55 –$1.65
†Grade C fuel oil	$0.85 –$0.90	$0.85 –$0.90

Note: For San Francisco cargo prices, add 5c per bbl. to above cargo prices.

In Ships' Bunkers, or deep tank lots, per bbl.:		
*Diesel fuel oil	$1.625–$1.65	$1.625–$1.65
†Grade C fuel oil	$1.075–$1.10	$1.075–$1.10

*Pacific specification 200. †Pacific specification 400.

Cased Goods: (Per case)		
U. S. Motor	$1.45 –$1.575	$1.45 –$1.575
400 e.p. blend, 65 oct. & above	$1.55 –$1.675	$1.55 –$1.675
*40-43 w.w. kerosine	$1.25 –$1.325	$1.25 –$1.325
Kerosine, p.w.	$1.20 –$1.30	$1.20 –$1.30

*150 fire point.

New York Export

(Prices in cents per gal. in bbls. F.a.s. New York)

CYLINDER OILS (Pennsylvania Products)

Bright stock:		
Light, 25 p.t.	22.50 –23.00	23.50 –24.00
Dark, 25 p.t.	22.00 –22.50	23.00 –23.50
Neutral oil:		
200 3 color, 25 p.t.	26.00 –26.50	26.00 –26.50
150 3 color, 25 p.t.	24.00 –24.50	24.00 –24.50
600 Warren E filtered	20.50 –21.00	20.50 –21.00
600 s.r., unfiltered	15.00 –15.50	15.50 –16.00
650 s.r., unfiltered	18.00 –18.50	19.00 –19.50
600 fl., s.r.	18.50 –19.00	19.50 –20.00
630 fl., s.r.	22.50 –23.00	23.50 –24.00

Wax, Domestic *and* Export

(Prices in cents per lb. Tests made by A. S. T. M. methods. Melting points shown below, however, are A. M. P., 3° higher than A. S. T. M. (E.M.P.) melting points. Export prices are f.a.s. carload lots. Domestic prices are f.o.b. refineries in New York and New Orleans districts, in bags, carload lots, with 0.2c discount allowed for shipment in bulk. Scale, solid and fully refined, slabs in bags.)

Prices Effective	Dec. 13	
	New York	
	Domestic	**Export**
124-6 Y.C. scale	2.75 – 2.85	2.75 – 2.85
122-4 W.C. scale	2.85 – 2.95	2.85 – 2.95
124-6 W.C. scale	2.85 – 2.95	2.85 – 2.95
123-5 Fully rfd.	4.45	4.125– 4.375
125-7 Fully rfd.	4.55	4.25 – 4.375
128-30 Fully rfd.	4.80	4.50 – 4.625
130-2 Fully rfd.	4.95	4.75 – 5.00
133-5 Fully rfd.	†5.35	5.25 – 5.375
135-7 Fully rfd.	†5.60	5.50 – 5.75
	New Orleans	
	Domestic	**Export**
124-6 Y.C. scale	2.75 – 2.85	2.75 – 2.85
122-4 W.C. scale	2.85 – 2.95	2.85 – 2.95
124-6 W.C. scale	2.85 – 2.95	2.85 – 2.95
123-5 Fully rfd.	4.45	4.125– 4.375
125-7 Fully rfd.	4.55	4.25 – 4.375
128-30 Fully rfd.	4.80	4.50 – 4.625
130-2 Fully rfd.	4.95	4.75 – 5.00
133-5 Fully rfd.	†5.35	5.25 – 5.375

†Shipment either in bags or in bulk.

Gulf Coast

(Prices are f.o.b. ship at Gulf oil terminals representing opinions of traders, except prices specified to the contrary. Prices cover bulk shipments of 20,000 bbls. or more, unless otherwise noted.)

Prices Effective	Dec. 13	Dec. 6
For Domestic shipment:		
MOTOR GASOLINE		
59 oct. & below	*5.125– 5.25	*5.25 – 5.375
60-64 oct. number	*5.25 – 5.375	*5.375– 5.50
65 oct. & above	*5.625– 5.75	*5.75 – 5.875
FUEL OILS		
No. 1	5.125	5.125
No. 2	4.50	4.50 – 4.625
No. 4	4.375	4.375– 4.50
KEROSINE		
41-43 w.w.	5.125	5.125
For Export Shipment:		
GASOLINE		
U. S. Motor	5.125– 5.25	5.25
60-62, 400 e.p.	5.25	5.25
61-63, 390 e.p.	5.25 – 5.375	5.25 – 5.375
64-66, 375 e.p.	5.25 – 5.375	5.25 – 5.375

*Nominal.

KEROSINE

44 w.w.	*5.50	*5.50
41-43 w.w.	5.125	5.125
41-43 p.w.	5.00	5.00

Prices Effective	Dec. 13	Dec. 6
GAS AND BUNKER OILS		
For Domestic and/or Export Shipment		
‡26-30 translucent gas oil	4.375– 4.50	4.375– 4.50
‡30 plus translucent gas oil	4.50 – 4.625	4.50 – 4.625
‡30 plus transparent gas oil	4.50 – 4.625	4.50 – 4.625
Diesel Oil Ship's bkrs.	†$1.90	†$1.90
Grade C bunker oil for ship's bunkers	†$0.95	†$0.95
Grade C bunker oil, in cargoes	$0.85	$0.85 •

‡Less than ½ of 1% sulphur. †Barging 5c bbl. additional at some Gulf ports.

MEXICAN CRUDE AND BUNKER OILS
(F.o.b. Steamer, Tampico)

Heavy Panuco crude, taxes to be paid	*$0.96	*$0.96
Grade C bunker oil, ship's bunkers, taxes paid	$0.95	$0.95

MID-CONTINENT LUBRICATING OILS

(Prices in cents per gal., bulk export shipment, f.o.b. Gulf.)

		*Dec. 6
190-200 vis. D 210 brt. stock	16.50 –17.00	23.50
150-160 vis. D 210 brt. stock:		
0-10 p.p.	13.50 –14.00	20.50
10-25 p.p.	13.00 –13.50	19.50
25-40 p.p.	13.00	19.50
150-160 vis. E 210 brt. stock	13.00	19.50
120 vis. D 210 brt. stock	12.50 –13.00	18.50
180 vis. No. 3 color neutral:		
0-10 p.p.	11.75 –12.00	16.50
15-30 p.p.	11.25 –11.50	16.00
200 vis. No. 3 color neutral:		
0-10 p.p.	12.25 –12.50	17.00
15-30 p.p.	11.75 –12.00	16.50
600 s.r. olive green	9.00 –11.25	12.50
600 s.r. dark green	7.00 – 9.25	10.50

*Prices in this column are f.a.s. Gulf oil terminals. Beginning Dec. 13, they are in bulk export shipment, f.o.b. Gulf.

SOUTH TEXAS LUBRICATING OILS

(Vis. at 103° cold test 0, bulk export shipment, f.o.b. Gulf oil terminals.)

Unfiltered Pale Oils:			
Vis.	**Color**		***Dec. 6**
100	No. 3	5.50	5.50 – 5.75
200	No. 3	7.25	7.25 – 7.50
300	No. 3	7.75	7.75 – 8.00
500	No. 3½	8.75	8.75 – 9.00
750	No. 4	9.25	9.25 – 9.50
1200	No. 4	9.75	9.75 –10.00
2000	No. 4	10.00 –10.25	10.25 –10.50

Red Oils:			
Vis.	**Color**		
100	No. 5-6	5.50	5.50 – 5.75
200	No. 5-6	7.25	7.25 – 7.50
300	No. 5-6	7.75	7.75 – 8.00
500	No. 5-6	8.75	8.75 – 9.00
750	No. 5-6	9.25	9.25 – 9.50
1200	No. 5-6	9.75	9.75 –10.00
2000	No. 5-6	10.00 –10.25	10.25 –10.50

Note: Red oil prices shown above cover oils with green cast; prices for blue cast red oils are slightly lower in some cases.

*Prices in this column are tanker, f.o.b. Gulf oil terminals. Beginning Dec. 13, prices are in bulk export shipment, f.o.b. Gulf.

Tanker Rates

(Approximate tanker freight rates to Continental ports, in shillings per ton of 2240 lbs., British sterling; to U. S. ports in cents per bbl.)

Rates Effective Dec. 13

	Crude &/or Fuel		Refined Oil &/or Spirits	
	Last Paid	Owners Ask	Last Paid	Owners Ask
Gulf-U.K./Cont.‡	22/	24/-25/	29/6	30/-32/
Aruba-U.K./Cont.‡	16/6	18/6-19/6	22/	27/6-28/6
Gulf-N. Atlantic** (not E. of N.Y.):				
Hvy. Crude & Fuel, (10 to 19.9 gravity)	29.5c	29.5c-30c	....	....
Light Crude, (30 Grav. or Lighter)	27c	27c	....	....
Gasoline	....	....	*31c	*35c
Kerosine	....	....	*32c	*36c
Light Fuel	....	....	*33c	*37c

‡Continental ports in range between Bordeaux and Hamburg, both inclusive.

*Nominal.

**Venezuela loading same rate; Tampico 2c to 3c per bbl. additional.

CRUDE OIL MARKETS

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I gravity. Prices are effective as of 7 a. m. of dates as given

EASTERN FIELDS

Posted by Joseph Seep Purchasing Agency

(Effective Dec. 1, 1937, except Corning Sept. 2, 1937)

Penna. Grade Oil in Southwest Penna. Pipe Lines.....$1.88
Penna. Grade Oil in Eureka Pipe Lines (West Virginia).....$1.82
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O.).....$1.70
Corning Oil in Buckeye Pipe Lines (Ohio)..$1.27

Posted by Other Companies

Tide Water Pipe Co., Ltd.
Bradford-Allegany district (Penna. and N. Y.) (Effective Dec. 1, 1937).....$2.20
*The Pennzoil Co.: (Effective Dec. 1, 1937)
Penna. Grade Oil in National Transit Lines *$2.15
Ashland Oil & Transportation Co.:
Somerset Oil in Ashland Lines (Ky.):
(Effective Jan. 28, 1937)
Big Sandy River.....$1.42
Kentucky River.....$1.50

*The Pennzoil Co. posts $2.15 in Cochran, Franklin, Hamilton and Doolittle, Pa. fields; prices in other lower districts range down to $2.10 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co.

Midland, Midland County (July 23, 1937)...$1.27

Posted by Simrall Pipe Line Corp.

(Effective July 22, 1937)

West Branch, Arenac, and equal grades.....$1.09

(Effective July 23, 1937)

Beaverton, Crystal, Greendale, Porter and equal grades.....$1.27
Buckeye.....$1.245

(Effective July 1, 1937)

Billings and Tobacco.....$1.395

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

(Effective Jan. 28, 1937)

Illinois, Princeton.....$1.35
Owensboro (Western Ky.).....$1.40

(Effective Nov. 20, 1937)

Lima, O.....$1.00

Posted by Stoll Oil Refining Co.

(Effective Feb. 1, 1937)

Stoll Pipe Line Oil (Ky.).....$1.40

CANADIAN FIELDS

Posted by Imperial Oil Limited

Western Ontario

(Effective Sept. 9, 1933)

Petrolia.....$2.10
Oil Springs.....$2.17

Alberta—Turner Valley

(Prices f.o.b. field tankage)

(Effective Sept. 1, 1937)

Clear Naphtha, 65 grav. & above.....$2.36

Crude Oil & Discolored Naphtha

40-40.9°	$1.36	53-53.9	$1.62
41-41.9	1.38	54-54.9	1.64
42-42.9	1.40	55-55.9	1.66
43-43.9	1.42	56-56.9	1.68
44-44.9	1.44	57-57.9	1.70
45-45.9	1.46	58-58.9	1.72
46-46.9	1.48	59-59.9	1.74
47-47.9	1.50	60-60.9	1.76
48-48.9	1.52	61-61.9	1.78
49-49.9	1.54	62-62.9	1.80
50-50.9	1.56	63-63.9	1.82
51-51.9	1.58	64-64.9	1.84
52-52.9	1.60	65° & higher, for discolored naphtha only	2.36

Note: Clear naphtha: 22 color; 10 lbs. vapor pressure, Reid method; 90% recovery; end point, 410°. Discolored naphtha; same specifications as for clear naphtha except color.

MID-CONTINENT

Posted by Stanolind Crude Oil Purchasing Co., Jan. 28, 1937

	(In Oklahoma-*Kansas)	(In North-North Central Texas)
Below 29	$1.06	$0.96
29-29.9	1.08	0.98
30-30.9	1.10	1.00
31-31.9	1.12	1.02
32-32.9	1.14	1.04
33-33.9	1.16	1.06
34-34.9	1.18	1.08
35-35.9	1.20	1.10
36-36.9	1.22	1.12
37-37.9	1.24	1.14
38-38.9	1.26	1.16
39-39.9	1.28	1.18
40 & above	1.30	1.20

Above Stanolind prices met as follows:

Jan. 28, Continental Oil Co. met in Okla., Kans., and North Texas. Sinclair-Prairie met in North Texas and North Central Texas, Jan. 28, Stanolind's North Texas schedule. Same date, The Texas Co. met in North-North Central Texas.

Note: Stanolind prices in Okla.-Kans. are for quantities computed by 97% tank tables. In Texas, 100% tank tables are used effective Oct. 1, 1937, volume corrected to 60° F., and deduction for full b.s. & w. content.

*Effective Aug. 1, 1937, for Otis-Albert pools Rush-Barton counties, Kans., 13c less.

Posted by Carter Oil Co.

In Oklahoma

(Effective Jan. 28, 1937)

Below 25	$0.98	33-33.9	$1.16
25-25.9	1.00	34-34.9	1.18
26-26.9	1.02	35-35.9	1.20
27-27.9	1.04	36-36.9	1.22
28-28.9	1.06	37-37.9	1.24
29-29.9	1.08	38-38.9	1.26
30-30.9	1.10	39-39.9	1.28
31-31.9	1.12	40 and above	1.30
32-32.9	1.14		

Above Carter schedule met Jan. 28 by the following companies: Sinclair-Prairie, Shell and Bransdall in Oklahoma-Kansas; Skelly Oil in Kansas; Tide Water in Oklahoma; Pure Oil in Oklahoma-Kansas, beginning with below 24 at $0.98 and ending with 40 & above at $1.30.

Posted by Magnolia Petroleum Co.

(Effective Jan. 28, 1937)

In Oklahoma, same schedule as Carter Oil, which see above, beginning with below 25, at $0.98 and ending with 40 & above, at $1.30.

In Texas: North and North Central, including Burkburnett, Archer, Henrietta, Electra, Comanche and Olden, same gravity and price schedule as Stanolind in North Texas, which see under Stanolind, beginning with below 29 at $0.96 and ending with 40 and above, at $1.20.

Beaumont, Tex.

(Effective Oct. 1, 1937)

Below 21°	$0.95	27-27.9	$1.15
21-21.9	0.98	28-28.9	1.17
22-22.9	1.01	29-29.9	1.19
23-23.9	1.04	30-30.9	1.21
24-24.9	1.07	31-31.9	1.23
25-25.9	1.10	32-32.9	1.25
26-26.9	1.13	33-33.9	1.27
		34 & above	1.29

TEXAS FIELDS

Posted by Humble Oil & Refining Co.

(*West Central Texas)

(Effective Jan. 28, 1937)

Below 29	$0.96	35-35.9	$1.10
29-29.9	0.98	36-36.9	1.12
30-30.9	1.00	37-37.9	1.14
31-31.9	1.02	38-38.9	1.16
32-32.9	1.04	39-39.9	1.18
33-33.9	1.06	40 and above	1.20
34-34.9	1.08		

*Includes Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, Throckmorton and Young counties.

Shell Petroleum Corp., effective Jan. 28, posts Humble's above schedule on Fisher county crude, plus these five lower grades, beginning with below 25 gravity at $0.88; 25-25.9, $0.90; 26-26.9, $0.92; 27-27.9, $0.94, and 28-28.9, $0.96; rest of schedule same as Humble's in West Central Texas.

Note: Effective Oct. 1, 1937, Humble prices are based on 100% tank tables at 60F.

**East Central Texas*

(Effective Jan. 28, 1937)

Below 29	$1.03	35-35.9	$1.17
29-29.9	1.05	36-36.9	1.19
30-30.9	1.07	37-37.9	1.21
31-31.9	1.09	38-38.9	1.23
32-32.9	1.11	39-39.9	1.25
33-33.9	1.13	40 and above	1.27
34-34.9	1.15		

*Including Anderson, Cherokee, Limestone, Navarro counties.

Same date, Sinclair-Prairie met in Mexia Humble's above schedule.

PANHANDLE TEXAS

Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

	Gray County	Carson-Hutchinson
Below 35	$0.96	$0.91
35-35.9	0.98	0.93
36-36.9	1.00	0.95
37-37.9	1.02	0.97
38-38.9	1.04	0.99
39-39.9	1.06	1.01
40 & above	1.08	1.03

Jan. 28, above prices met by Sinclair-Prairie and Magnolia in the entire area and by Continental in Carson-Hutchinson and by Texas Co. in Panhandle Sweet, same as Humble's Gray Co. and on Panhandle Sour, same as Carson-Hutchinson.

EAST TEXAS

(Effective May 22, 1937)

Stanolind, Humble, Shell, Sinclair-Prairie, Texas Co., and Magnolia.....$1.35

Shell also posted on Jan. 28, in Livingston area, Polk County, Texas, $1.27.

NORTHEAST TEXAS

(Posted by Humble, Jan. 28, 1937)

Talco.....$0.73

(Posted by Magnolia, Jan. 28, 1937)

Cass County and Panola County, Tex.:

Same gravity and price schedule as S. O. Louisiana posts for Rodessa, La., which see under that company.

(Posted by The Texas Co., Jan. 28, 1937)

Cass County.....$1.25

WEST TEXAS AND NEW MEXICO

Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

(Including Andrews, Crane, Crockett, Ector, Glasscock, Howard, Winkler and Upton Counties, Texas and Lea county, New Mexico).

Below 26	$0.78	33-33.9	$0.94
26-26.9	0.80	34-34.9	0.96
27-27.9	0.82	35-35.9	0.98
28-28.9	0.84	36-36.9	1.00
29-29.9	0.86	37-37.9	1.02
30-30.9	0.88	38-38.9	1.04
31-31.9	0.90	39-39.9	1.06
32-32.9	0.92	40 & above	1.08
Pecos, West Texas			$0.91

Jan. 28, Magnolia met Humble in Crane, Upton, Howard, Glasscock, Mitchell and Winkler.

Shell Petroleum Corp., on Jan. 28, met Humble in Crane, Glasscock, Howard, Pecos (except Yates shallow pool), Winkler, and Upton counties, Tex., and in Lea County, N. Mex. On Jan. 28, Shell posted in Yates shallow pool in Pecos county, Tex., $0.81. June 4, 1937, Shell added Ector county to West Texas postings.

Jan. 28, Stanolind Oil & Gas Co. met Humble in Hendrick field, Winkler county.

Jan. 28, Texas Co. met Humble in Ward and Winkler counties, Tex., and Lea County, N. M.

April 20, 1937, Sinclair Prairie met Humble in Ward and Winkler, Tex. and Lea, N. M., counties, except that its gravity schedule ends with 36 and above, at $1.00.

Posted by Continental Oil Co.

(Effective Jan. 28, 1937)

Artesia, Jackson and Maljamar pools, N. M...$0.90

COLORADO

(Posted by Continental Oil Co.,
Effective Jan. 28, 1937)
Ft. Collins and Wellington

Below 29	$1.01	35-35.9	$1.15
29-29.9	1.03	36-36.9	1.17
30-30.9	1.05	37-37.9	1.19
31-31.9	1.07	38-38.9	1.21
32-32.9	1.09	39-39.9	1.23
33-33.9	1.11	40 & above	1.25
34-34.9	1.13		

Cannon City and Florence, Col.....$1.10

SOUTH AND SOUTHWEST TEXAS

Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

Carroll, Clark, Darst Creek, Hilbig, Salt Flat and Zoboroski fields.....$1.09
Pettus.....$1.37 Van Zandt.....$1.10

(Effective Nov. 1, 1936)

Heyser heavy....$0.90 Placedo heavy..$0.90
Heyser light..... 1.15 Taft..... 0.95

Shell Pet. Corp. on Jan. 28, posted $1.09 in Salt Flat district, Tex.

Anahuac, Dickinson, Flour Bluff and Turtlebay
(Effective Jan. 28, 1937)

Below 31	$1.16	36-36.9	$1.28
31-31.9	1.18	37-37.9	1.30
32-32.9	1.20	38-38.9	1.32
33-33.9	1.22	39-39.9	1.34
34-34.9	1.24	40 and above	1.36
35-35.9	1.26		

Jan. 28, Magnolia met Humble in Darst Creek: posted $1.00 in Luling; $1.12 in Lytton Springs; $1.27 for Cleveland, Liberty county, Tex.; $1.15 in Hardin, Liberty county, Tex.

Jan. 28, 1937, The Texas Co. met Humble in Darst Creek.

Posted by Humble

Conroe, Raccoon Bend, Tomball and Satsuma

(Deep sand crudes)

(Effective Jan. 28, 1937)

Below 29	$1.20	35-35.9	$1.34
29-29.9	1.22	36-36.9	1.36
30-30.9	1.24	37-37.9	1.38
31-31.9	1.26	38-38.9	1.40
32-32.9	1.28	39-39.9	1.42
33-33.9	1.30	40 & above	1.44
34-34.9	1.32		

Jan. 28, Magnolia met Humble in Tomball and Texas Co. met Humble in Conroe, beginning with 35-35.9 gravity.

(*Continued on next page*)

CRUDE OIL MARKETS

(*Continued from preceding page*)

Posted by Humble

Mirando, Heavy and Light

(Effective July 6, 1937)

Below 21	$0.96	31-31.9	$1.18
21-21.9	0.98	32-32.9	1.20
22-22.9	1.00	33-33.9	1.22
23-23.9	1.02	34-34.9	1.24
24-24.9	1.04	35-35.9	1.26
25-25.9	1.06	36-36.9	1.28
26-26.9	1.08	37-37.9	1.30
27-27.9	1.10	38-38.9	1.32
28-28.9	1.12	39-39.9	1.34
29-29.9	1.14	40 & above	1.36
30-30.9	1.16		

July 6, Magnolia posted same schedule as Humble in Mirando.

July 6, 1937, Texas Co. posted for Duval-Mirando, $0.96 for below 21, plus 2c differential, to $1.12 for 28 & above.

NORTH LOUISIANA-ARKANSAS

Posted by Standard Oil Co. of Louisiana

(Effective Jan. 28, 1937)

(In Caddo, Homer, Haynesville, Sabine, De Soto, Sarepta, Carterville, El Dorado, Bunkie, and Miller county).

Below 25	$0.90	33-33.9	$1.08
25-25.9	0.92	34-34.9	1.10
26-26.9	0.94	35-35.9	1.12
27-27.9	0.96	36-36.9	1.14
28-28.9	0.98	37-37.9	1.16
29-29.9	1.00	38-38.9	1.18
30-30.9	1.02	39-39.9	1.20
31-31.9	1.04	40 and above	1.22
32-32.9	1.06		

Rodessa, La.

(Effective Jan. 28, 1937)

Below 25	$0.93	33-33.9	$1.11
25-25.9	0.95	34-34.9	1.13
26-26.9	0.97	35-35.9	1.15
27-27.9	0.99	36-36.9	1.17
28-28.9	1.01	37-37.9	1.19
29-29.9	1.03	38-38.9	1.21
30-30.9	1.05	39-39.9	1.23
31-31.9	1.07	40 and above	1.25
32-32.9	1.09		

Smackover, Ark.	$0.90
Urania, La. (La. Oil Refg. Co., Jan. 10, '36)	0.97
Tepetate, La. (Continental Oil, Jan. 28, '37)	1.24

Jan. 28, 1937, Magnolia met S. O. La.'s No. La.-Ark. gravity and price schedule in Pine Island, Haynesville, Bull Bayou and Cotton Valley, La., and in Eldorado and Rainbow districts, Ark.; and met S. O. La.'s Rodessa prices; and in Lockport, Iowa, Cameron Meadow, La., posted Humble's gravity and price schedule on Mirando.

Jan. 28, The Texas Co. met S. O. La. in N. La., except that its gravity schedule begins with below 27 at $0.94. It posted $1.37 for Garden Island, La., $1.24 for LaFitte, La. and $0.90 for Smackover.

*GULF COASTAL FIELDS

Posted by Humble Oil & Refining Co. and The Texas Co.

	(Effective Jan. 28, 1937) Humble	Texas	Saxet (Humble) (July 6 '37)
Below 18	$0.95	$0.90	....
18-18.9	for	0.92	....
19-19.9	below	0.94	
20-20.9	21°	0.96	$1.01
21-21.9	0.98	0.98	1.03
22-22.9	1.01	1.01	1.05
23-23.9	1.04	1.04	1.07
24-24.9	1.07	1.07	1.09
25-25.9	1.10	1.10	1.11
26-26.9	1.13	1.13	1.13
27-27.9	1.15	1.15	1.15
28-28.9	1.17	1.17	1.17
29-29.9	1.19	1.19	1.19
30-30.9	1.21	1.21	1.21
31-31.9	1.23	1.23	1.23
32-32.9	1.25	1.25	1.25
33-33.9	1.27	1.27	1.27
34-34.9	1.29	1.29	1.29
35-35.9	1.31	for	1.31
36-36.9	1.33	oil	1.33
37-37.9	1.35	34°	1.35
38-38.9	1.37	and	1.37
39-39.9	1.39	above.	1.39
40 and above	1.41	....	1.41

*Humble's prices apply in these fields: Barbers Hill, Goose Creek, Hull, Humble, Liberty, Moss Bluff, Mykawa, Orange, Pierce Junction, Plymouth, Rabbs Ridge, Raccoon Bend (shallow sand), Refugio light and †heavy, Sour Lake, Spindletop, Sugarland and West Columbia. †Except these grades of Refugio heavy: effective July 6, 1937: Below 20, $0.95; 20-20.9, $1.01; 21-21.9, $1.03; 22-22.9, $1.05; 23-23.9, $1.07; 24-24.9, $1.09; and 25-25.9, $1.11; rest of schedule same as other Gulf Coastal crude.

Jan. 28, Sinclair-Prairie met above Humble schedule in full.

July 6, 1937, The Texas Co. posted for Refugio, which includes Greta, Saxet and Taft: $1.01 for below 21, plus 2c differential, to $1.17 for 28 & above.

Texas Co. postings in Gulf Coastal Texas include: Arriola, Five Corners, Ganado, Humble, Liberty, Magnet, Manvel, Markham, Mauritz, Pickett Ridge, Port Neches, Sour Lake, West Columbia and Withers. In Gulf Coastal Louisiana: Bay St. Elaine, Caillou Island, Dog Lake, Four Isle, Gillis, Horseshoe Bayou, Iberia, Lake Barre, Lake Pelto, Leesville and Port Barre.

ROCKY MOUNTAIN FIELDS

Posted by Stanolind Oil & Gas Co.

(Effective Jan. 28, 1937)

Salt Creek, Midway and Dutton Creek, Wyo., same schedule as Stanolind posts in Oklahoma, Kansas which see under Mid-Continent crude on previous page.

Greybull-Torchlight	$1.30
Iles, light, Col.	1.18
Iles, heavy	1.12
Hogback, N. M.	1.33
Big Muddy	1.23
Elk Basin, light	1.30
Grass Creek, light	1.30
Frannie light	0.82

(Effective Nov. 4, 1936)

Grass Creek, heavy	$0.62
Frannie heavy	0.62
Hamilton Dome, Wyo.	0.57

Posted by Ohio Oil Co.

(Effective Jan. 28, 1937)

Elk Basin, Wyo.	$1.30
Grass Creek, light	1.30
Rock Creek	1.205
Lance Creek	0.97

(Effective Nov. 16, 1937)

Sunburst, Mont.	$0.90

Posted by Continental Oil Co.

(Effective Jan. 28, 1937)

Cat Creek, Mont.	$1.40
Big Muddy, Wyo.	1.18
Lance Creek, Wyo.	0.97

CALIFORNIA, *Posted by Standard Oil of California*

All gravities above those quoted take highest price offered in the field. Prices effective Feb. 26, 1936, except Huntington Beach, Playa del Rey, Santa Fe Springs, Kern Front, Signal Hill (Long Beach) effective March 7, 1936; Elk Hills effective June 22, 1936; Lakeview Area, Aug. 19, 1936; El Segundo and Wilmington, Oct. 15, 1937

Gravity	Signal Hill (Long Beach) El Segundo †Wilmington	Seal Beach	Alamitos Heights	Huntington Beach	Inglewood	Playa del Rey	Olinda Brea Canon	Athens Rosecrans	Dominguez	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	‡Newhall and others	Mountain View	Elk Hills	Buena Vista Hills **Midway-Sunset	Lakeview Area	Lost Hills	Coalinga	Wheeler Ridge
14-14.9	$0.80	0.79	0.74	0.78	0.79	0.80	0.76	....	....	0.80	0.76	0.76	0.77	0.78	....	0.70	....	0.70	0.70	0.70	0.70	0.70	....
15-15.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	.70	.70	.70	....
16-16.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	.70	.70	.70	....
17-77.9	.80	.79	.74	.78	.81	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	.70	.70	.70	....
18-18.9	.80	.79	.74	.78	.84	.80	.78	....	....	.82	.76	.76	.77	.78	....	.70	....	.70	.70	.70	.70	.70	....
19-19.9	.82	.79	.74	.82	.87	.84	.81	....	....	.85	.76	.78	.77	.78	....	.70	.70	.74	.74	.74	.74	.71	.70
20-20.9	.85	.79	.74	.85	.90	.88	.84	....	....	.88	.78	.82	.77	.80	....	....	.70	.78	.78	.78	.78	.72	.70
21-21.9	.88	.79	.74	.89	.93	.93	.88	....	....	.91	.80	.85	.77	.84	.78	....	.73	.82	.82	.82	.82	.74	.70
22-22.9	.92	.82	.74	.92	.96	.98	.92	....	....	.93	.84	.89	.79	.88	.78	....	.77	.87	.87	.87	.86	.78	.72
23-23.9	.95	.86	.77	.96	.99	1.02	.96	.84	.79	.96	.88	.93	.82	.92	.78	....	.80	.92	.92	.92	.90	.82	.76
24-24.9	.99	.91	.80	1.00	1.02	1.06	.99	.88	.81	.99	.91	.96	.85	.96	.82	....	.84	.97	.97	.97	.94	.86	.79
25-25.9	1.03	.95	.82	1.03	1.05	1.11	1.03	.93	.83	1.02	.95	....	.89	.99	.86	....	.88	1.01	1.01	1.01	.98	.90	.83
26-26.9	1.06	1.00	.85	1.07	1.09	1.16	1.06	.98	.86	1.05	.98	....	.92	1.03	.90	....	.91	1.06	1.06	1.06	1.02	....	....
27-27.9	1.10	1.05	.88	1.11	1.12	....	1.10	1.03	.88	....	1.02	....	.96	1.06	.95	....	.95	1.10	1.10	1.10	1.06	....	....
28-28.9	1.14	1.10	.90	1.14	1.15	....	1.14	1.07	.90	....	1.06	....	.99	1.10	.99	....	.99	1.15	1.15	1.15	1.10	....	....
29-29.9	1.17	1.15	.93	1.18	1.18	....	1.17	1.12	.93	....	1.09	....	1.03	1.14	1.03	....	1.02	1.20	1.20	1.20	1.14	....	....
30-30.9	1.21	1.19	.95	1.22	1.21	....	1.21	1.17	.95	....	....	....	1.07	1.17	1.08	....	1.06	1.25	1.25	1.25	1.18	....	....
31-31.9				....	1.24		1.24	1.22	.97	....	....	....	1.11	1.21	1.12	....	1.09	1.29	1.29	1.29			
32-32.9		*Elwood Terrace		....	1.27		1.27	1.27	1.00	....	....	....	1.14	1.25	1.16	....	1.13	1.34	1.34	1.34	Kettleman Hills		
33-33.9	....	1.28	....	....	....		....	1.32	....	....	....	....	1.18	1.28	1.20	....	1.17	1.38	1.38	1.38	....	1.19	....
34-34.9	....	1.32	....	....	....		....	1.37	....	....	....	....	1.22	1.32	1.25	....	1.20	....	....	....	....	1.23	....
35-35.9	....	1.35	....	....	....		....	1.42	....	....	....	....	1.25	....	1.29	....	....	....	....	....	....	1.27	....
36-36.9	....	1.39	....	....	....		....	1.46	....	....	....	....	1.29	....	1.33	....	....	....	....	....	....	1.31	....
37-37.9	....	1.43	....	....	....		....	1.51	....	....	....	....	1.32	....	1.37	....	....	....	....	....	....	1.35	....
38-38.9	....	....	....	....	....		....	1.56	....	....	....	....	1.36	....	1.42	....	....	....	....	....	....	1.39	....
39-39.9	....	....	....	....	....		....	1.61	....	....	....	....	1.40	....	....	....	....	....	....	....	....	1.43	....
40-40.9	....	....	....	....	....		....	1.66	....	....	....	....	1.43	....	....	....	....	....	....	....	....	....	....

F. O. B. Standard Pipe Line

*F. o. b. ship.

‡Also McKittrick, Kern River. Kern Front and Round Mountain $0.70 thru 19.9 gravity; no higher gravity quoted. **Except Lakeview Area.

†Wilmington prices differ on gravities below 18.9. Prices are: 14-16.9, $0.75; 17-17.9, $0.77; and 18-18.9, $0.79; rest of schedule same as Signal Hill.

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Coming Meetings

American Chemical Society, Division Organic Chemistry, Richmond, Va., Dec. 28, 29 and 30.

1938

Independent Oil Jobbers Assn. of Okla., Oklahoma City, Okla., Jan. 13.
American Road Builders Assn., Cleveland, Ohio, Jan. 17 to 21.
Northwest Petroleum Assn., North Dakota Division, Minot, N. D., Jan 24 and 25.
Northwest Petroleum Assn., Minnesota Division, Hotel Radisson, Minneapolis, Jan. 27 and 28.
Kentucky Petroleum Marketers Assn., Brown Hotel, Louisville, Ky., Feb. 7, 8 and 9.
Kansas Oil Men's Assn., 24th annual convention and oil exposition, Hotel Broadview, Wichita, Kans., Feb. 14 and 15.
American Institute of Mining and Metallurgical Engineers, annual meeting, Engineering Societies Bldg., New York, N. Y., Feb. 14 to 18.
Association of Highway Officials of the North Atlantic States, Hotel Ambassador, Atlantic City, N. J., Feb. 16, 17 and 18.
Ohio Petroleum Marketers Assn., fifteenth annual meeting, Hotel Deshler-Wallick, Columbus, Ohio, Feb. 22, 23 and 24.
Wisconsin Petroleum Assn., Schroeder Hotel, Milwaukee, Wis., Feb. 22, 23 and 24.
Indiana Independent Petroleum Assn., Spring Convention and Refiners and Suppliers Exhibit, Hotel Severin, Indianapolis, Ind., March 2, 3 and 4.
American Society for Testing Materials, Spring Regional Meeting and Group Committee Meetings, Seneca Hotel, Rochester, N. Y., March 7 to 12.
American Assn. of Petroleum Geologists, 23rd annual meeting, Roosevelt Hotel, New Orleans, La., March 16 to 18.
American Petroleum Institute, division of production, spring meeting, southwestern district, Blackstone Hotel, Fort Worth, Texas, March 24 and 25.
National Petroleum Assn., Cleveland, Ohio, April 13 to 15.
Petroleum Industry Electrical Assn., Rice Hotel, Houston, Texas, April 13, 14 and 15.
American Chemical Society, Dallas, Texas, April 17 to 21.
American Institute of Mining and Metallurgical Engineers, Open Hearth Conference, Buffalo, N. Y., April 20, 21 and 22.
International Petroleum Exposition, Tulsa, Okla., May 14 and 21.
American Petroleum Institute, mid-year meeting, Wichita, Kan., May 23, 24 and 25.
Natural Gasoline Assn. of America, Hotel Tulsa, Tulsa, Okla., some time in May.
Pennsylvania Grade Crude Oil Assn., Pittsburgh, Pa., June 16, 17 and 18.